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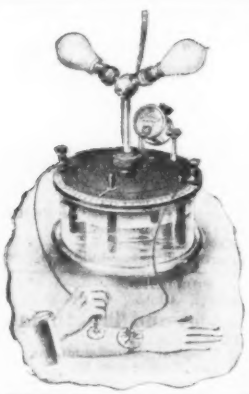

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# Observations
ON
# THE DEVELOPMENT OF THE REGULATION OF TEMPERATURE AND ITS CLINICAL SIGNIFICANCE.[1]

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A WARM-BLOODED animal is distinguished from a cold-blooded one by its capacity to maintain the internal temperature of its body at a level which is almost the same in the depth of winter as in the height of summer. This power of regulation is not possessed by all animals and is not developed equally among the warm-blooded animals; its evolution can be traced in the animal series and in the individual bird or mammal during its passage from immaturity to maturity. Some mammals, such as the hibernating animals, have retained some of the characteristics of their cold-blooded ancestors, for during the winter they become torpid and pass into a cold-blooded condition. Upon these points the data which have been collected within recent years have yielded most interesting evidence in support of the Darwinian theory of evolution.

## REGULATION OF TEMPERATURE IN VARIOUS CLASSES OF ANIMALS.

A rudimentary power of regulation is found in several groups of the cold-blooded animals. Insects as a class are cold-blooded, but many observations have shown that bees in a hive can maintain a temperature considerably above that of the external air. Vipers and pythons may have a temperature ten degrees above that of their surroundings. The lowest mammals, the monotremes, possess only an imperfect power of maintaining their temperature at a constant level; the average temperature of the echidna and ornithorhynchus is 29·8° C. (85·6° F.) when the air is 15° (59°), and shows a considerable variation when the temperature of their environment is changed; the echidna hibernates for a period of four months. A further link between the two great groups of animals, the cold-blooded and the warm-blooded, is found in those higher mammals, such as the marmot, dormouse, hedgehog, and bat, which hibernate during the winter; they have acquired the power of regulating their temperature, but at the same time have retained some of the physiological characteristics of their cold-blooded ancestors. The temperature of these animals is inconstant, even during the summer, and in winter, when they are torpid, surpasses but little that of their surroundings.

The temperature of newly born pups, kittens, rabbits, and rats falls when they are removed from the warm surroundings afforded by their dam and continues to fall until it reaches a point a few degrees above the temperature of the air. Newly born guinea-pigs, on the other hand, are able to maintain their temperature if the exposure to cold be not excessive; they are at birth in a condition of great development, they are well covered with fur, their eyes are open and they are able to run about. On these grounds the young offspring of warm-blooded animals can be placed in two classes—those which at birth are blind, helpless, in some cases naked, and unable to regulate their temperature, and those which are born in a condition of greater development and capable of maintaining the heat of their bodies at a fairly constant level. Young birds can be classified in a similar manner; the pigeon is an example of the former, the chick well represents the latter class. The members of the first class respond to changes of external temperature in a manner similar to that of the ordinary cold-blooded animal. Their combustion, as measured by the output of carbon dioxide, varies with, and in the same direction as, the temperature of their surroundings. The representatives of the second class increase their combustion when they are exposed to cold; they resemble warm-blooded animals. The development of this power of regulating the temperature of the body by appropriate variations in combustion can be traced in the embryo chick. In infants this capacity is imperfectly developed at birth, and evidence will be given later that this applies to the regulation of the loss as well as the production of heat.

The evolution of the warm-blooded animal has been traced, but the nature of any structural changes which are essential for the transition from the cold-blooded stage is unknown. The search after gross morphological differences would appear to be a fruitless one, for the capacity to regulate temperature may be suspended and restored under natural conditions of hibernation, and by its very nature can be studied only in the living animal. Observations of physiological as well as pathological conditions indicate that the most important factors are the coördination of the nervous control over the skeletal and vascular muscles in response to sensations of heat and cold.

## FACTORS CONCERNED IN REGULATION OF TEMPERATURE.

The nature and value of the factors upon which an animal's capacity to regulate its temperature depends must now be considered. Life in all organisms, whether they be animal or vegetable, simple or complex, is accompanied by chemical change and the production of heat. The living tissues require a high internal temperature for the due manifestation of their activities; the warm-blooded animals maintain this favourable condition by a constant struggle against cold and heat; the cold-blooded animals have not acquired this property, and within limits the activity of their tissues depends upon the external temperature. Both of these conditions are advantageous to the respective groups of animals in the struggle for existence; the warm-blooded animals are able to live a more ardent life, unbroken by long periods of inactivity or torpor, and within wide limits independent of the temperature of their surroundings. The constant exercise of the different organs of the body, especially of the nervous and muscular systems, must lead to greater development of the nervous system, and with it the intelligence of the warm-blooded animal. On the other hand, the food-supply of the cold-blooded animals depends upon the external temperature; a period of torpidity, therefore, in which the activities of the tissues are reduced to the lowest ebb consistent with the retention of life, tides th cold-blooded animal over the winter, when the food is scarce, and prolongs its life beyond one brief summer.

The heat of an animal will remain at a constant level when the loss and production of heat balance. Combustion can be augmented or diminished only within certain limits; it is economical, therefore, for the superior animal that he should be able also to control his temperature by variations in the loss of heat from his body. The development of the latter power depends upon the increasing control exerted by the nervous system upon the body in response to sensations of heat and cold; this is seen in the attitude assumed, the vascularity of the skin, the activity of the sweat glands, and the ventilation of the lungs.

It is in the regulation of the production of heat that one of the most difficult physiological problems is found. How is it that the higher animals are able to struggle successfully against the general law, that cold diminishes and heat increases chemical activity? The cells of warm-blooded animals are not exempt from this law, for, isolated from the nervous control of the animal, they respond to heat and cold in a manner similar to that seen in typical cold-blooded animals. In the healthy body of the higher animals the chief cells are not put to this test; they have their own internal environment and are not subject to fluctuations in the external temperature, for in response to the sensation of cold the central nervous system causes the glands, and especially the muscles, to produce more heat; on the other hand, a sensation of heat results in diminished activity of those organs. The voluntary muscles are the most important sources of heat, for not only are they the seat of great chemical changes during contraction, but they form between 40 and 50 per cent. of the weight of the body. The regulation of the production of heat demands the constant control of the central nervous system over the skeletal muscles.

## THE CENTRAL NERVOUS SYSTEM AND TEMPERATURE REGULATION.

The dependence of the temperature of the warm-blooded animal upon impulses passing to and from the central nervous system is apparent from a consideration of the

[1] Being an abstract of the Oliver-Sharpey lectures delivered before the Royal College of Physicians of London.

means whereby the power of regulating temperature can be diminished, suspended, or abolished. Such means are: (1) sleep, (2) hibernation, (3) anæsthetics, (4) alcohol, (5) curare, and (6) lesions of the central nervous system.

1. *Sleep.*—When nervous and muscular activity are reduced to the natural minimum during sleep, the temperature of a healthy man falls to its lowest point. The chief factor in the daily variation in temperature is the alternation of a day of activity with a night of rest; a reversal of the ordinary routine, the turning of night into day, brings with it a corresponding change in the temperature. In nocturnal birds the temperature rises during the night and falls during the day. Muscular activity signifies increased production of heat. There is evidence, however, that during sleep the capacity to regulate temperature is diminished, and this appears to apply to both heat and cold. Extremes of external temperature are less bearable during sleep, as shown by the fact that a man sleeping in his clothes finds it too cold in winter and too hot in summer. This diminished capacity appears to be one of the factors to account for the frequency of night sweats, especially in children, and of cases of heat-stroke at night.

During the deep sleep which follows fatigue the sensitiveness of the nervous system is so reduced that the regulation for extreme cold fails, the unconsciousness of sleep gradually passes into the unconsciousness of collapse, and the man dies "frozen to death," it is said, but in reality killed long before his temperature falls to zero. The activities of the tissues, once the nervous control is lost, are reduced by cold; there is less and less chemical change accompanied by the production of heat, and at an internal temperature about 20° (68°) life ceases. Experience has too often shown that the weary traveller who gives way to the imperative desire to sleep upon the line of march is doomed to death when there is no protection from extreme cold.

2. *Hibernation* is the only natural condition in which the suspension of the capacity to regulate temperature can be traced in all its stages. During torpidity the mammal responds to changes in the external temperature in a manner similar to that seen in a cold-blooded animal.

3. *Anæsthetics.*—In deep anæsthesia the activities of the body are reduced so profoundly that the production of heat is diminished. The influence of the anæsthetic is manifested especially on the central nervous system. Sensations of heat and cold no longer arise, or should they arise no longer reflexly produce decreased or increased activity of the skeletal muscles or the muscles of the blood-vessels. Control over both production and loss of heat is lost. The internal temperature of animals anæsthetised by chloroform, ether, or chloral will fall to 22° (71·6°) when they are exposed to moderate cold, and it is the cold rather than the drug which brings about a fatal issue. Although such animals may have in their fur a good protection against loss of heat their temperature falls; they can no longer assume the natural coiled posture which diminishes the loss of heat, and owing to their muscular inactivity they produce far less heat. The combustion in the body can be measured by a determination of the respiratory exchange; this is reduced during anæsthesia, even if the external temperature remains the same, and much more so if the surroundings become colder. The response of the anæsthetised mammal to heat and cold resembles that of a normal cold-blooded animal.

4. *Alcohol* causes a fall in temperature, not, as is popularly believed, an increased heat of the body. It is true that after drinking alcohol there is a feeling of increased warmth, but this is due to the greater vascularity of the skin and the activity of the sweat glands. Alcohol appears to act in two ways; in ordinary doses it has little or no effect on the production of heat in the tissues, but increases the loss of heat by causing the cutaneous vessels to dilate, stimulating the sweat glands and quickening the circulation. The normal reaction to cold, increased production of heat and constriction of the blood-vessels of the skin, is partly paralysed by large doses of alcohol, with the result that drunkards exposed to cold are quickly "frozen to death." Poisonous doses may cause a fall of 5 or 6 or even 10° centigrade; many of the lowest temperatures recorded in man have been observed in drunken persons exposed to cold. On the other hand, the disordered regulation of temperature produced by heavy drinking may show itself in a rise of temperature during work in, or exposure to, a hot and moisture-laden atmosphere.

5. *Curare* paralyses the voluntary muscles and thus deprives the warm-blooded animal of its control over the chief seat of the production of heat. The curarised animal resembles a cold-blooded animal.

6. *Lesions of the central nervous system.*—Much controversy has arisen concerning the nature of the effects produced by injuries of the nervous system. Different observers have found that lesions apparently similar have caused in some cases a rise, in others a fall of temperature. The controversy has continued for over a century, since the observations and experiments of Benjamin Brodie in 1811, but it would be an unnecessary task to attempt to review all that has been said and done upon the subject. Fortunately this can be avoided without throwing discredit upon the discordant results obtained by different observers, for in many cases it can be shown that different external conditions produce opposite results in the temperature of the body.

The consideration of this complex subject will be facilitated by an examination of the effect produced by lesions localised in the different parts of the nervous system. The cerebrum has been removed from pigeons and dogs and the animals have been kept alive for months. The capacity to regulate the temperature is not lost; the animal shows a daily curve in its temperature, responds appropriately to sensations of heat and cold, but cannot maintain its temperature perfectly if it is left for long in a cold room. In these animals, it is important to remember, the motor and sensory paralysis produced by the operation is relatively small. In man the temperature of anencephalic monsters does not appear to have been investigated in detail, but there is on record the case of an infant, 8 months old, in whom the cerebral hemispheres were absent owing to a congenital defect; in this case the temperature remained constant during the two months or so that the infant was under observation in the hospital and no disturbance in regulation was noted.

Injuries to the corpus striatum and the optic thalamus produce so frequently a disturbance in temperature that these ganglia have been described by many observers as the special "heat centres" which regulate the production and loss of heat in the body. There are difficulties in this localisation. The corpus striatum is a prominent organ in all the vertebrates, the cold-blooded as well as the warm-blooded; phylogenetically it is a very old structure, the basal portion of the fore-brain. The optic thalamus is a part of the inter-brain, and at one stage in the development of the vertebrates it appears to have served with the corpus striatum as a brain. In the mammals the function of the corpus striatum is obscure, but, according to Kinnier Wilson, it exercises a steadying effect on the action of the cortico-spinal system by means of the lenticulo-rubro-spinal system or more indirectly by the optic thalamus and its cortical connexions. In the dog the corpora striata and parts also of the optic thalami were removed with the cerebral hemispheres by Goltz; the animal lived for a long time, and its capacity to regulate its temperature, although diminished in range, was not lost. Similar results have been obtained by other observers. Removal of the mid-brain as well as the fore-brain destroys the capacity to regulate temperature. It would appear that punctures or lesions of the corpus striatum have an augmentor or an inhibitory effect upon the incoming and outgoing nervous impulses which are concerned in the reception of sensations of heat or cold and in the coördination of the activity of the various organs of the body, especially the skeletal muscles and the muscles of the blood-vessels. In agreement with this view is the fact that lesions of the crura cerebri and pons may be accompanied in some cases by a rise, in others by a fall, in the temperature of the body.

After complete transverse section of the spinal cord the temperature may rise above the normal (hyperthermia), fall below the normal (hypothermia), or remain at the normal level according to the site of the lesion and the external conditions, but in all cases the capacity for regulation is impaired. In a paraplegic animal the anterior portion of the body responds to changes of external temperature in the manner characteristic of a warm-blooded animal; the posterior or paralysed portion, on the other hand, responds to such changes as does a cold-blooded animal. The effect

observed when the external temperature rises or falls is the resultant of these opposite tendencies. In the paralysed parts there is no control over the production and the loss of heat; the production rises and falls *with* the temperature.

The experimental evidence supports the view, already suggested by the development of the power of regulation, that the capacity is not accompanied by the appearance of any special structure in the animal, but is associated with the control of the nervous system over the muscles and glands and with increased sensibility to changes of temperature. There is no satisfactory evidence of the existence of special "heat centres."

## THE CLINICAL SIGNIFICANCE OF THE DEVELOPMENT OF THE REGULATION OF TEMPERATURE.

In clinical work little attention has been paid to the development of the nervous control over the temperature of the body, although there are many problems upon which it would throw light. A few examples may be given.

### *Points in Relation to Infants and Children.*

Infants show no daily variation in temperature during the first few days after birth, for they have no definite periodicity, rest during the night and activity during the day. For a similar reason the healthy young infant has a smaller range of temperature than that seen in a young child or adult. At birth it does not possess the power of maintaining a constant bodily heat, and its temperature will fall if it be exposed to moderate cold. It needs warmth, and the most appropriate is that supplied by the mother's body; snug in bed in its mother's arms it is kept warm, for the temperature of the mother's skin is about 35° (95°), and the air under the bedclothes may be as high as 30° (86°). The infant needs mothering, and instinct is a safer guide than the smattering of science which teaches that the newly born child should be taken away from its mother in order that it may breathe purer air, not worry its mother, nor run the risk of being overlain. The infant requires warm surroundings, for before birth it was protected against the loss of heat by the temperature of the uterus, 37° (98·6°) or thereabout; it is less sensitive than the adult to slight changes in the gaseous composition of the air it breathes, for during fœtal life it maintained its gaseous exchange with the mother's blood, in which the pressure of oxygen is below, and the pressure of carbon dioxide greatly above, that of the corresponding gas in the air. The danger of overlying arises almost entirely from drunken mothers, and is much less serious for the race than the undermining of maternal instinct.

The regulation of the loss as well as the production of heat is imperfect in the infant, especially if it be a weakling. Even when it is well clothed and kept in a room at 15·6° (60°) it may have a rectal temperature as low as 34° (93·2°) and may not show an appropriate response when it is sponged. The vernix caseosa is a protection against excessive loss of heat and injury of the delicate skin, notwithstanding the fact that it is regarded by the nurse as dirt to be removed as soon as possible by hot water and soap. The old-fashioned way, the smearing of the body with oil, has much evidence in its favour. In premature infants the use of incubators for their rearing is a recognition of their incapacity to maintain their temperature; as in the case of cold-blooded animals, their exchange of material and growth will be stimulated by warmth, depressed by cold. Strong infants, who respond to moderate cold by vigorous movements and lusty screaming, do not require a high external temperature maintained at a constant level; a sturdy growth will be encouraged by exposure to variations of temperature, for the regulation of the heat of the body depends upon the activity of the muscles in response to sensations of cold. In children's wards there is too often a failure to recognise that nutrition depends upon muscular activity, which in turn is stimulated by cold; a child covered up in bed is exposed to the warm air (about 25° C. or 77° F.) under the bed-clothes, and although it requires more sleep than the adult, it also needs, in relation to its size, far more opportunities for muscular activity. Ward discipline and convenience will not alter biological laws. The inclination of a sick child to get out of bed and play is one of the best signs of improvement.

In warm weather the loss of heat is diminished, therefore less food for combustion, but more liquid for evaporation is needed. If muscular activity and its beneficial effect upon nutrition and growth are to be maintained the child must be lightly clad. The chemical changes in a child's body are relatively greater both in quality and quantity than those of an adult, and for this reason it is easier for the child to compensate for cold than for heat. Guided by instinct, the child will adapt itself, but trammelled by the ignorance of its elders, who have abandoned instinct for the conventions of modern civilisation, it is placed at a serious disadvantage during a heat wave. Especially at night-time during warm weather the child should be allowed to lie exposed if it is so inclined, for healthy sleep is accompanied by a fall in temperature.

### *Other Examples of Clinical Significance.*

Another example of failure to recognise at first the relationship between muscular activity and the temperature of the body was seen in the modern treatment of consumptives by an open-air life and progressive muscular work. In some sanatoriums it was the custom to order rest in bed for patients whose temperature showed a rise after exercise, because it was believed that the healthy man maintained a constant temperature. Muscular work raises the temperature of healthy men and animals, and the rise to the optimum is an advantage, for it favours the exchange of material upon which efficient work depends.

In practice the application of the modern theory that heat-stroke is due to a hypothetical micro-organism is dangerous; it neglects the relation between muscular work and the regulation of temperature, which affords an adequate explanation of the disorder and of the success of the cold-water treatment.

In anæsthesia the paralysis of sensation and voluntary movement is associated with the suspension of the capacity to regulate the temperature; the deeper the anæsthesia the greater the loss of control over the production and loss of heat. Numerous observations show that the internal temperature of the body falls during anæsthesia unless artificial warmth be applied. The typical response to changes of external temperature is no longer seen; the metabolism and heat of the body rise and fall with the external temperature. The patient loses heat by the skin and the respiratory tract; it is possible to diminish or prevent the cutaneous loss by warm clothing and a heated operation table, and the pulmonary loss by making the patient breathe air and anæsthetic vapour already warmed and moistened. It is not necessary to have the temperature of the operation theatre raised to a tropical heat, which diminishes the efficiency of the staff and introduces the danger of the sweat of the operators undoing their elaborate precautions against sepsis.

Morphia blunts other sensations as well as those of pain, and by reducing the excitability of the central nervous system diminishes the capacity to regulate the temperature. There is evidence to show that in some cases at least the collapse observed in wounded soldiers, who have been exposed to cold, may be due to the large doses of morphia administered to them when they received first-aid. As regards the action of alcohol, attention has been drawn already to the diminished capacity of drunkards to resist cold or heat and the recognition of alcohol as an important factor in the incidence of heat-stroke.

The disturbances produced in the temperature of patients by lesions of the central nervous system have attracted much attention, but the cases have been regarded as very obscure owing to the fact that lesions apparently similar may be accompanied in one case by no obvious change in temperature, in another by a fall of temperature, hypothermia, in another by a rise of temperature, hyperthermia, or in another by a sequence of all three conditions. Regarded from the point of view of the theory of specific heat centres these cases are obscure, but considered in relation to the development of the power of regulation of temperature such variations would be expected. A complete transverse section in the lower cervical region of the spinal cord divides the living body into two parts: the upper, under control of the chief sensory and motor mechanisms, is warm-blooded; the lower, paralysed and relegated to its more primitive level, resembles in its response to heat and cold a cold-blooded animal. The effect observed is the resultant of the opposite tendencies of the two portions of the body. Treatment must be based upon a recognition of this condition.

An adequate consideration of evidence in support of the foregoing remarks is impossible in the limits of an abstract, but will be supplied when the lectures are published.

# An Address
ON
# THE TUBERCULOUS SOLDIER.

*Delivered at the Annual Meeting of the National Association for Prevention of Tuberculosis, held on July 26th,*

BY SIR WILLIAM OSLER, BART., M.D., F.R.S.,
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GENTLEMEN,—No matter how well organised an army from the sanitary standpoint, we have to face the fact that the soldier takes with him to the field two great enemies, the tubercle bacillus and the pneumococcus. In proportion as the incidence of the war pestilences, typhoid, typhus, dysentery, cholera, and malaria falls the importance of these civil germs rises. In a group of above 50,000 picked workmen at Panama, for centuries the "white man's grave," with the progressive control of yellow fever, dysentery, and malaria, and a fall in the general death-rate to a point lower than in any American city, up went the curves of pneumonia and of tuberculosis, until, as in temperate regions, these diseases headed the list. The Allied armies in the West have been singularly free from camp diseases—no cholera, typhus, or malaria, and extraordinarily little enteric. Never before in history has so great a host been assembled, never before in any war have armies been so healthy. The common civilian diseases have had their innings, and have played relatively the more important rôle—colds and coughs, rheumatism in many forms, and mild fevers. When the mortality statistics of diseases are published from the army of the West the "best killer" will be found to have been the pneumococcus, a home-bred germ, which the soldier takes with him or easily procures from a comrade. A short, sharp, honest disease, pneumonia either kills at short range or recovery is rapid and without sequelæ.

## THE PROBLEM BEFORE THE NATION.

Our business to-day is with a very different germ, the longest range variety of all—the tubercle bacillus—and its martial relationship. Three preliminary statements are necessary: 1. In a majority of the cases the germ enlists with the soldier. A few, very few, catch the disease in infected billets or barracks. What percentage of men between the ages of 18 and 40 harbour the tubercle bacillus we do not know, but we do know that it is exceptional not to find a few in the bodies of men between these ages dead of other diseases. 2. Of one million enlisted men between the ages aforesaid the proportion to develop tuberculosis is probably much smaller than if these men had remained in civil life. It will be possible later to work out the exact incidence for comparison with the figures already available; but the circumstances of the soldier life as a rule do not weaken, but strengthen, the body's resistance. Everyone must have been impressed with the beneficial change wrought by a year in the army upon the physique of the average town lad. 3. Exposure, hardships in the field, injury, drink, and syphilis may bring about conditions in the body favouring the development of bacilli already existing or which may gain access to it, and the soldier reports *sick* with tuberculosis of lungs, glands, pleura, bones, or brain.

The problem before the nation is what to do with the tuberculous among about one-tenth of the population who have undertaken its defence. Even were a loyal gratitude to these brave fellows not involved, the obligation is plain to care for them in the best possible way—the doubtful cases to study, the early cases to cure, the incurable to succour to the end. Society, itself directly responsible for the prevalence of the disease, owes this duty to the tuberculous, whether soldiers or civilians. I do not think we are to look for a great increase in the number of cases in that portion of the community which has undertaken military service. We are not going to double our tuberculous population, and are not to expect 70,000 deaths instead of 50,000 annually. The question is simply one of extension and perfecting of existing organisations, extension for which the profession has been clamouring for ten or more years, and the bettering of an organisation which unfortunately has radical defects. Democracy "comes high" when parochialism is its final outcome. Successful war can never be waged without a strong general staff, with absolute subordination of the units. Warfare against the Germans in two years has cost very many lives, but the tubercle bacillus in one year costs this country 50,000 lives. In either case a strong central controlling machine is the first element of success. We may hope so to perfect our war machine as to conquer the Germans within the three years; but where is the general staff which is to wage the next 30 years' war against consumption! Lethe-loving Molluscs, we missed the golden opportunity of the Royal Commission a few years ago to establish national control of the nation's greatest domestic war, and instead of a Napoleonic campaign we have the guerilla warfare of the borough, county, and district council, with counsels of perfection in place of commands from the Local Government Board.

## NUMBER AND CLASSIFICATION OF CASES.

But let us review the conditions—the number of tuberculous soldiers, the classification of the cases, the existing machinery and its possibilities.

*Number of cases.*—In 1915, 2770 cases of tuberculosis were dealt with by the Chelsea Boards. In reply to Mr. Astor in the House of Commons on Feb. 22nd, Mr. Tennant stated that of these 1641 were awarded pensions, and 1129 claims were not allowed. We cannot say what proportion this total number bears to the enlisted force, but in any case it is small in comparison with the general incidence of the disease in the community. I have tried to get the exact figures from several hospitals. At the American Women's War Hospital, Paignton, among the first 3000 cases admitted there were only three cases of pulmonary tuberculosis (Dr. Penhallow). At the Canadian Hospital, Taplow, among 6233 admissions there were 26 proved, and 16 doubtful cases (Captain Neff). This hospital serves a large section, takes all classes, and at one time admitted many Territorials from local training camps. The Paignton figures represent men admitted from France and the Mediterranean. 1 per 1000 is, I am afraid, too low an estimate. The Taplow figures are likely to be nearer the truth.

*Classification.*—In the first place, let us demand a careful sifting of the cases. The label does not always mean tuberculosis. Bone, joint, gland, and meninges offer no difficulties, but tuberculosis of the lungs and pleura is beset with diagnostic pitfalls. Make a primary separation into the two great groups of the open and closed pulmonary forms. With bacilli in the sputum the case is definite, and in all stages we know what to do. The closed case is a suspect, to be studied in a sceptical attitude, and not to be labelled tuberculous without the most critical scrutiny. A large majority of us in this room are closed cases of pulmonary tuberculosis—that is to say, we have small foci of infection in lung or bronchial gland. Some day over the parapets rush the long-entrenched enemy, and a local flare-up in the lung, with cough and fever or an acute pleurisy, are the outward and visible signs of the attack. Let us ask to have the closed cases considered apart, labelled as such and carefully followed. This is not the occasion to deal more fully with this class. One-half of the cases I have seen are not tuberculosis. The claims of the doubtful forms must be determined by experts. So far as the relation to service is concerned, there are three groups: I. The old *poitrinaire* who has slipped past the recruiting officer and the medical examiner. A pathetic and comic element blend in the story of these cases. I saw the history sheet the other day of a man who had been for four years in attendance at a tuberculosis dispensary with bilateral disease, but he slipped in, stood his training, and was actually sent to France. On his way to a sanatorium from Cheltenham a man with fever and bacilli in the sputum changed his mind and enlisted at Worcester! The consumptive has a never-failing optimism and considers himself much better than he really is. I have notes by Dr. Stobie, our tuberculosis officer, of 12 men in attendance at our Oxfordshire dispensaries, all with bacilli, who have been passed for the army. I pass round his notes. II. Healthy men with a past history of pleurisy or of pulmonary tuberculosis and in whom the vicissitudes of the soldier's life have stirred up the old trouble. Hæmoptysis after a route march, pleurisy with effusion, acute broncho-pneumonia with

return of the bacilli indicate the recurrence. III. The healthy recruit who has either been infected in the army or has had a latent focus, one cannot say which. We should make no difference in the treatment of these cases. Even when mistakes have been made the country is responsible, and they are citizens as well as soldiers. In an inquiry made by Dr. McConnel in 13 sanatoriums out of 160 cases, 90 were regarded as due to the war; in five other places "most or very many of the 84 cases were attributed to this cause."

### THE EXISTING MACHINERY.

Let us take the existing machinery in three stages of his career. The tuberculous soldier comes under the Army rule that when a man is unfit for military service he is discharged. As the decision of the Army Board is of the "Medes and Persians" type, it is all-important that it should be made only after the most careful consideration of each individual case. Discharged tuberculous, the civilians to whose care he is entrusted must take him as such, with no shadow of doubt—is it not written on his discharge paper? And it is assumed that he will never again be fit for military service. Altogether it is a very black-ball against a man's physique. This stage has been dealt with in your Council's last report. Last year, at the instance of Dr. Theodore Acland, Dr. Perkins arranged a meeting of the Council with Sir Robert Morant, Dr. Newsholme, and Army representatives, at which the matter was fully discussed. The Council, I may say, was of opinion that much good would follow if the tuberculous soldier could be allowed sanatorium treatment before his discharge, but this does not seem possible to arrange. So far stage No. 1. Stage No. 2 is more fully dealt with in the following paragraphs of the report:—

Sir Robert Morant kindly attended a meeting of the Council of the Association and explained the machinery for dealing with the problem and the steps which his department took. The Insurance Commissioners received notice from the War Office of all tuberculous soldiers who were about to be discharged from the Army. They then notified the Local Insurance Committee to whom the man's case naturally belonged, and by whom suitable provision was made, the Commissioners paying £20 per case to ensure priority of treatment and so avoid delay before admission. So far the cases dealt with had amounted to 1400, and Sir Robert assured the Council that in no single case had his department failed to find accommodation. There had, of course, been individual instances in which men neglected to take advantage of the provision offered.

Provision of treatment for the individual does not, however, end the matter. An adequate pension must be granted. This is the more necessary because, if he is discharged from the Army, as has hitherto been the rule, the separation allowance, on which his wife and children depend, ceases. Anxiety for their welfare seriously interferes with the results of treatment, and, as a matter of fact, the best class of man is apt to sacrifice his own future to return home and work for his family; thus all prospect of lasting recovery vanishes. In lieu of becoming a self-supporting citizen for the future he tends to degenerate into a chronic invalid, to become a burden on the community, and spread the disease.

We all recognise how anxious Sir Robert Morant and his colleagues are to provide institutional treatment for tuberculous subjects. To inquiries made in many places I have had, as a rule, satisfactory answers. At Newcastle, for example, I was assured recently that there had been no trouble and that they had empty beds. On the other hand, I have heard complaints of delays in getting into monetary touch with a Local Insurance Committee, and in many places the sanatorium accommodation is wholly inadequate. In Wales, where I have had the pleasure recently of inspecting many of the dispensaries and sanatoria, I was told that the supply of beds for soldiers was sufficient, and I visited at Newport an excellently arranged special hospital for soldiers. There is no reason why this stage, No. 2, of his progress should not be easily and satisfactorily arranged. The machinery is there, but it is not always possible to get the soldier to use it; too often he prefers to go home. Dr. Neff, of Taplow Hospital, tells me that not 1 in 10 of the English tuberculous soldiers will accept treatment! It is to be hoped that a large proportion of the men who receive treatment will be so improved as to be able to do light work, with a pension as the nucleus of their support, sick benefit and sanatorium benefit having come to an end. The soldier then returns to his village and is taken charge of by the local committee of the National Society for Looking After the Disabled Soldiers and Sailors. He is found suitable work, or trained in some remunerative occupation, and he finally graduates into the class of self-supporting citizens. One important question—of the 2770 cases in 1915 only 1641 were rewarded pensions, the claims of the others were not accepted. Why?

Stage No. 3, which one-half of the cases will reach, offers serious difficulties. Tuberculosis is essentially a chronic disease. As Garth says: "Her strokes are sure, but her advances slow." The soldier becomes a chronic consumptive, unable to work, perhaps without a pension, or with one insufficient to support his family, even with the permanent disablement allowance. This is the man we must look after, but his case is beset with problems. In the first place, his ship is adrift, neither Army nor Government at the helm. The public must undertake to keep him off the rocks. Officially we are helpless, as our rate charity, which should partake of the nature of a common chest at the disposal of a stranded brother, is too tainted for a self-respecting man to touch. At present these men are literally at sea, and in most places without proper guidance or care. Many are able to do light work in the intervals of attacks of fever. Past the sanatorium stage there is often no place for such patients to go, as the general hospital does not like the open tuberculous. Suitable hospitals for advanced cases are not common, and unless very attractive, home, even a wretched home, is preferred. Many such cases are living in surroundings impossible to keep aseptic, and the danger of infection is very great. I have gone over with one of our tuberculosis nurses the list of 15 discharged soldiers in Oxfordshire. I will not worry you with details, many of which are most distressing, but they show that the need of organised help for the men who have reached Stage 3 is urgent.

### SUGGESTIONS.

Reviewing the whole subject the following suggestions appear to be in order.

1. A more searching examination should be made of recruits. Doubtful cases should be referred to the tuberculosis expert of the district. Men unfit to be worked up to the soldier standard become simply material for pension claims.

2. Army experts should decide upon the doubtful cases before discharge. Provision should be made for their study. There are plenty of tuberculosis specialists in khaki whose knowledge should be used to put these borderland cases into their proper categories.

3. A national organisation should look after the welfare of the tuberculous soldier, with subsidiary branches in each county. A roll and a record should be kept, and every case supervised with the greatest care. As the man who suggests a new society in these days deserves to be shot, I would urge that this National Association undertake the work, in coöperation with the Society for the After-care of Soldiers. A small central committee of these two bodies, with representatives of the Local Government Board and of the Insurance Commissioners, could organise after-care committees in each county and bring official pressure to bear upon authorities to furnish the proper hospital accommodation.

A public duty which is at the same time a privilege is not likely to be neglected, and the people of this country may be relied upon to care to the end for men stricken by disease while fighting their battles.

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THE King has given to Dr. L. C. P. Phillips, professor at the Government School of Medicine, Cairo, and physician to His Highness the Sultan of Egypt, His Majesty's Royal licence and authority to wear the Insignia of the Third Class of the Order of the Nile, which has been conferred upon him in recognition of valuable services rendered.

PATRIOTIC SHOPPING.—The medical profession, in common with other professional organisations, has taken means to protect the interests of its members who are on active service, and will view with sympathy the appeal issued by three Secretaries of State to extend the same consideration to those whose shops and businesses are likely to suffer from their absence. The circular, which is addressed to mayors and the chairmen of local authorities, deprecates the transfer during the war of customers' patronage to other than their usual tradespeople.

# SERUM REACTIONS OF 300 UNSELECTED CASES OF "ENTERIC"* WITH THE OXFORD STANDARD AGGLUTINABLE CULTURES.

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(*From the Thompson Yates Laboratory.*)

DURING the last few months a large number of "convalescents" from the Eastern Mediterranean have entered the Auxiliary Hospitals of the First Western Command with a diagnosis of typhoid or "enteric," and some with a diagnosis of paratyphoid. As nearly all have been recently inoculated against typhoid though not against paratyphoid, it seemed to us highly probable that many of the cases were wrongly diagnosed as typhoid, especially as a large number had certainly suffered from dysentery. Because practically all were "convalescent," and nothing could be learned by blood cultures, and very little by examining the excreta, we attempted to arrive at a bacteriological, and therefore correct, diagnosis, by testing the agglutination reactions with the Oxford Standard Agglutinable Cultures of typhoid and paratyphoid A and B.

The work was commenced in the second week of November. Three hundred unselected cases were examined, drawn as far as possible consecutively, from St. John's Hospital at Southport, the Liverpool Royal Infirmary, the Liverpool Tropical School Auxiliary Military Hospital, and the Mill Road Auxiliary Military Hospital. Most of the work was done in the Pathological Laboratory of the University of Liverpool, the rest in Southport.

### *Agglutination Technique.*

The technique was carried out exactly as recommended in the "Directions" issued from the Department of Pathology,[17] Oxford University, on behalf of the Medical Research Committee. In order to save time many pipettes were used, and the drying of the pipettes and agglutination tubes after washing was hastened by placing them in a hot oven. The agglutination tubes were incubated in a water-bath at 55° C., and kept at that temperature by placing the bath in a paraffin oven supplied by Messrs. Baird and Tatlock; the oven accommodated eight racks of tubes. After two hours' incubation the tubes stood for from 10 to 15 minutes at room temperature, and then the readings were taken. This was done in a cupboard with a black background containing an electric lamp; the cupboard prevented daylight of varying intensity diffusing into the electric light, and so causing the readings taken during the day or night to differ. Some such apparatus as this is essential for accurate work, especially if the readings are taken by different observers.

*The readings* were all taken by one or other of us, but the technique in fully a third of the cases was carried out by a laboratory assistant, who was quickly taught. Every serum was tested to typhoid, paratyphoid A, and paratyphoid B, the dilutions being 1–25, 50, 125, 250, also, if necessary, 1–500, 1000, 2500, 5000. Frequently there was an agglutination with sedimentation in a tube, e.g., 250, and no agglutination whatever in the next, e.g., 500. In such cases the agglutination titre is indicated in our paper by 250 +.

*Agglutinin units.*—In order to ascertain the number of "standard agglutinin units" it is necessary to divide the titre by a figure given on the bottle. During our work this denominator for paratyphoid A varied from 2·7 to 4·1 and for paratyphoid B 2·7 to 3·5, a change which had no appreciable effect on our results. The figure for typhoid, however, gradually rose from 4·7 to 7·7. In certain cases this change raised the agglutination titre—e.g., Case 9, paratyphoid A series, first examined seven weeks after convalescence, titre 125 (denominator 5·6); three subsequent examinations, titre 250 (denominator 7·7). If such an alteration in the emulsion has undoubtedly caused an apparent rise in titre, we have assumed, when interpreting our results, that there has been no change in titre. We have found the Oxford emulsions most satisfactory. On rare occasions they become cloudy after frequent use, probably from bacterial contamination.

*Collection of blood.*—Our greatest practical difficulty was to obtain sufficient blood to yield the necessary six complete drops of serum. We found it necessary to direct special attention to the following points: (*a*) Wright's capsules: Those supplied by many firms are too small and not properly shaped. The lumen of the tube should be at least $\frac{3}{8}$ inch in diameter; the length, excluding the tapering ends, $1\frac{1}{4}$ inches. The curved end should be of wide diameter and short, otherwise the large drops of blood will not flow quickly into the tube, and fall on the floor. (*b*) Collecting the blood: The patient was instructed to hang his arm down or, better, to swing it round several times. If necessary he soaked the hand in hot water to cause vascular dilatation. A rubber catheter, not a piece of tape, was bound round the finger as far as the terminal phalanx, and the back of the finger pricked near the nail with a large triangular surgical needle, size No. 1. An ordinary needle does not make a large enough hole. If enough blood was not obtained the rubber was removed, and after the finger had been massaged it was reapplied. 0·75 of a c.c. of blood is sufficient. The blood was collected by the ward sisters, who became experts after a little tuition.

### *Accuracy of Technique.*

Hort[3] stated, although employing Dreyer's emulsions: "We do not find the drop method of sufficient accuracy for routine work on a large scale." After making over 3000 examinations we disagree with this statement, for example: Sixty-six consecutive convalescent cases of "enteric" had their agglutinins estimated on four occasions at intervals of about a week; about 80 per cent. of the tests were done by one observer. In 34 convalescents all four tests gave the same titre, including 5 convalescents in whom the titre rose one tube, due to a change in the emulsion denominator from 5·6 to 7·7. In 15 convalescents three tests gave the same titre, the variation in the remaining test was a rise or fall of one tube only; in 10 cases this variation was probably due to technical error, and in 5 cases to alteration in agglutinin titre. In 15 convalescents two tests gave the same titre; 10 showed a variation in one tube only, 5 of which were probably due to error, and the other 5 showed a variation of two tubes only, none of which were probably due to error. In 2 convalescents every test gave a different titre, the extreme variation being three tubes, none of which were probably due to error.

In our experience an alteration in titre in one tube only in successive tests with the same emulsion probably indicates an alteration in the amount of agglutinins, though it possibly indicates an error; whereas an alteration of two tubes certainly indicates an alteration of agglutinins, so long as gross carelessness can be excluded. It is quite true that greater accuracy would be attained by using "considerable volumes" of serum, as Hort suggests, instead of drops. This, however, is not practicable in most laboratories in war time, as it would require so much blood and more apparatus. It is quite true, also, that greater accuracy would be attained if the intervals between the tubes were less than 25, 50, 125, &c., for then the exact "end point" would always be reached, but this would again demand more time and apparatus.

Some of our errors were probably due to using slightly hæmolysed blood, for with it the "end point" is more difficult to read; to not always obtaining six full-sized drops of serum, owing to insufficient blood being taken; and, perhaps, to keeping the blood on certain occasions three or four days before testing. It is probably advisable to hold the dropping pipette at the same angle when distributing the drops, and to use a separate pipette for each sample throughout the dilution technique.

In our opinion the macroscopic method, as perfected by Dreyer and his collaborators, is eminently suitable for routine work on a large scale in war time, particularly for bacteriologists without any previous training. The technique itself can easily be mastered by an intelligent orderly after a short time. The method also has this great advantage, it is a successful and scientific attempt to standardise "enteric"

* "Enteric Fever:—Varieties: (*a*) Typhoid Fever; (*b*) Paratyphoid Fever." See 1916 edition Nomenclature and Classification of Diseases, Royal College of Physicians (at present in the press); THE LANCET, 1916, vol. i., p. 887.

agglutination tests, and therefore to make the results obtained in different laboratories strictly comparable.

It is impossible satisfactorily to compare results obtained by using different macroscopic or microscopic techniques and emulsions of different densities of sometimes dead and sometimes living organisms derived from different strains, often of doubtful parentage, of different inherent agglutinative capacity, cultivated on different media for different periods of time, perhaps at different temperatures, and, last but not least, of using different standards for positive or negative results.

The average Briton unfortunately is a "conscientious objector" to employing standard methods and apparatus It interferes with the "freedom of the individual." The Medical Research Committee has, if we may be allowed to say so, acted most wisely, not only in advertising this particular "standard method," but also in supplying the apparatus and emulsions free to all R.A.M.C. officers, and if it was generally adopted the ultimate gain would far outweigh any temporary loss, due to change of technique.

*Controls.*—We have tested the diagnostic value of standard emulsions by various controls and found that the serum of those vaccinated against typhoid or convalescent from typhoid produces no co-agglutinin for paratyphoid A or paratyphoid B 1–25. On the other hand, typical paratyphoid A bacilli have been isolated from the excreta of 4 convalescents, typical paratyphoid B bacilli from 8, and typhoid from 2, by other workers in the laboratory—namely, Dr. Vera Foley, Dr. Mary Price, and Dr. A. L. Robinson; the sera of all 14 convalescents agglutinated the corresponding emulsions in titres ranging from 1–25 to 1–500.

### *Results.*

*Clinical.*—Seventy-eight per cent. were admitted with a diagnosis of typhoid or "enteric," and 22 per cent. of paratyphoid or stated that paratyphoid was a second diagnosis; 4 stated they had paratyphoid A and B. Ninety-three, i.e. 31 per cent., said that the first diagnosis was dysentery, while 112, i.e. 37 per cent., gave a history of severe diarrhœa with a passage of blood and slime, often with straining. Eighty-five per cent. had apparently contracted "enteric" on the G—— Peninsula and the remainder in E——, M——, or elsewhere. Every patient was also asked whether blood was taken from the arm, i.e. for blood culture; from the finger or ear on a slide, i.e. for malaria; or in a tube, i.e. for agglutination test. The date of reporting sick, which was usually remembered to the very day, and the duration of the illness until they were allowed to get up for the first time, was also ascertained in each case. Thus we were able to obtain a rough idea of the date of the beginning of convalescence.†

Of 260 men who were questioned 254 stated they had been inoculated against typhoid, 1 refused inoculation, 1 had not been inoculated, 4 were not sure; 40 men, all examined in November, were not questioned. Six stated that they had been inoculated against paratyphoid in 1915; 4 of them were inoculated in August or later, 3 at M—— and 1 at A——; the details for the others were not ascertained. Three of these cases agglutinated typhoid and paratyphoid A only, 1 typhoid only, while 2 agglutinated neither typhoid nor paratyphoid A or B in 1–25.

We do not attach undue importance to the statements made by the soldiers, but must say that, on the whole, their answers were very intelligent and quite definite, much more so than those of the average hospital patients. Practically everyone knew his maximum temperature, and knew whether he passed blood or slime. One or two were not quite certain whether their blood was examined, as they had been delirious. Hardly any knew whether their excreta had been examined, and if so with what results.

*Serological.*—Prophylactic typhoid vaccination almost always produces more or less typhoid agglutinins which usually persist for months or even years. Consequently, as Dreyer and his co-workers point out, (1) a serological diagnosis of active typhoid in the inoculated cannot be made without "two or more successive examinations" separated by "intervals of a few days" to see if any variation in the typhoid titre occurs; and (2) a serological diagnosis of active paratyphoid can be made in persons who have not been inoculated against paratyphoid by one examination only, for "agglutination in a dilution of 1–25 justifies a strong suspicion of paratyphoid infection ..... marked agglutination in a dilution of 1–50 or more is (nearly always) diagnostic of active paratyphoid infection."[17]

In almost all of our 300 cases the febrile period was passed and *convalescence* well established, consequently the first of these principles will not apply. Dreyer,[4] however, also states that in typhoid convalescents who had not been inoculated against typhoid, the typhoid agglutination titre "will always show a definite and measurable diminution of titre in the course of a week or two." One would naturally therefore expect that in typhoid convalescents who had been inoculated against typhoid the typhoid agglutination titre would also show a diminution in the course of a week or two, though the titre would not fall below the "higher base line" which is found in the inoculated. One would also expect that the paratyphoid titre in paratyphoid convalescents would show a measurable diminution in a week or two. Unfortunately, owing to war conditions, it has been impossible for us to test the agglutination titre of every convalescent on two or more occasions and at the same intervals; nevertheless 216 were tested more than once, usually three or four times.

Tidy[14] has stated recently that "there is evidence that marked pyrexia, perhaps 102° F. for five days, is associated with diminution or complete disappearance of" typhoid inoculation agglutinins. "These agglutinins may return, but *usually do not*" (italics ours). He infers, therefore, that "a positive agglutination reaction to B. typhosus after the fifth day of pyrexia has the same value in an inoculated as in an uninoculated person." Tidy has published very little evidence in support of his rather revolutionary statements; besides, he employed a microscopic method, which is less accurate than the best macroscopic method. Dreyer, Gibson, and Walker[7] have just published figures which completely dispose of his main contention.

We ourselves estimated the typhoid agglutinins of 15 inoculated soldiers taken consecutively, who had suffered from pyrexia of at least 102° F. and for at least five days, due to lobar pneumonia, acute pleurisy, rheumatic fever, and surgical complaints; in 3 the pyrexia was still present at the time the blood was taken. All agglutinated typhoid in titres varying from 1–50 to 1–500.

It is possible, though not proved, that the general lowering of "resistance" which occurs in diseases associated with prolonged pyrexia may sometimes temporarily diminish the titre of "inoculation" agglutinins. To act, however, on the assumption that a positive typhoid agglutination reaction has "the same value" in the inoculated as in the uninoculated might be disastrous for the Army, with all respect to Captain Tidy. Clearly, if the serological tests were believed, the "vast majority of febrile affections occurring in those recently inoculated against typhoid would necessarily be diagnosed as typhoid."[7] In our opinion cases of dysentery with pyrexia from the Eastern Mediterranean were wrongly diagnosed as typhoid last summer, because is was not sufficiently realised how high the titre of typhoid "inoculation" agglutinins might be.

### GROUP I.—*Cases Agglutinating Paratyphoid A or Paratyphoid B.*‡

*Paratyphoid A series.*—Thirty-six cases agglutinated in titres ranging from 1–25 to 1–250, and typhoid from 1–25 to 1–250. They were first examined on the average seven weeks after the onset of convalescence; 31 were examined on at least one subsequent occasion; the average time between the first and last examinations was four and a half weeks.

*Paratyphoid B series.*—Seventy-four cases agglutinated in titres ranging from 1–25 to 1–2500, and typhoid from 1–25 to 1–2500. They were first examined on the average seven weeks after the onset of convalescence; 52 were examined on at least one subsequent occasion; the average time between the first and last examinations was five weeks.

*Comments.*—Almost all, if not all, the cases in this group are examples of recent paratyphoid infection for the following reasons.

1. (*a*) Out of 87 who were questioned, 86 stated that they were inoculated against typhoid. (*b*) Only 3 stated that they were inoculated against paratyphoid—1 in August, 1915, and 2 in December, 1915. Probably they were mistaken, first because paratyphoid vaccine has only been used systematically this year, and, secondly, because none of the

† The men rarely knew on what date their temperature became normal.

‡ Complete tables of these cases and some other additional matter will shortly be published in the Journal of the Royal Army Medical Corps.

three agglutinated paratyphoid B, which they probably would have done after a mixed vaccine of paratyphoid A and B, especially as the agglutination titre reached by paratyphoid B is on the average much higher than that for paratyphoid A when tested with the Oxford emulsions. After testing the serum reactions of about 600 cases of dysentery and "enteric," we have so far found only three sera agglutinating both paratyphoid A and B; two had been inoculated with paratyphoid vaccine and the third apparently had not. (*c*) Possibly, of course, one or two of the cases may have had paratyphoid fever before the war, and the paratyphoid agglutinins have persisted and so misled us. There was, however, no clinical evidence of these attacks, and the error from this cause must be negligible.

2. If the typhoid agglutinins were due to typhoid inoculations several months ago, and the paratyphoid agglutinins to a paratyphoid infection a few weeks ago, one would expect the titre of the latter to diminish, as a rule, in the four weeks which elapsed between the two examinations, whereas the titre of the former would show little or no diminution, provided that the typhoid agglutinins were uninfluenced by paratyphoid coagglutinins. That this is actually the case is shown in a remarkable manner in Table I.

TABLE I.—*Cases Agglutinating Paratyphoid and Typhoid, showing the Percentage in which the Titres of Paratyphoid and Typhoid remained Stationary, Rose, or Fell between the First and Last Examinations.*

Paratyphoid A first examined average 7·1 weeks after convalescence; last examined 11·5 weeks. Paratyphoid B first examined average 6·3 weeks after convalescence; last examined 11·2 weeks.

| | Paratyphoid. | | | | Typhoid. | | | |
|---|---|---|---|---|---|---|---|---|
| — | No. of cases. | Stationary % | Rise % | Fall % | No. of cases. | Stationary % | Rise % | Fall % |
| P. T. A ... | 31 | 19·4 | 3·2 | 77·4 | 28 | 82·1 | 3·7 | 14·2 |
| P. T. B ... | 52 | 11·5 | 4·0 | 84·5 | 50 | 76·0 | 6·0 | 18·0 |
| P. T. A and B... | 83 | 14·5 | 3·6 | 81·9 | 78* | 78·2 | 5·2 | 16·6 |

* This figure is reduced from 83 to 78, because 4 cases did not agglutinate typhoid 1–25, and 1 was tested only once for typhoid.

(*a*) The difference in the behaviour between the typhoid and paratyphoid agglutinins is even greater than shown in the table, because the typhoid titre fell markedly—i.e., more than 1 tube in only 1·4 per cent., whereas the paratyphoid titre fell markedly in 48 per cent. during approximately the same interval.

(*b*) Though the paratyphoid titre has fallen in the majority of cases and usually to a marked degree, there are a few, as one would expect, in which it remained either stationary or fell at first only. In this connexion it is interesting to note that those which remained stationary were first examined 8·2 weeks after convalescence, average interval 5·7 weeks; those which fell one tube 7·4 weeks, average interval 4 weeks; those which fell two or more tubes 5·5 weeks after convalescence, average interval 5·4 weeks.

It is remarkable that the titre of the paratyphoid "infection" agglutinins when first tested was usually less than that of the typhoid "inoculations" agglutinins, and also usually diminished rapidly and often disappeared, while that of the typhoid agglutinins showed no change. Thus 13 out of the 31 paratyphoid A cases first examined 7·6 weeks after convalescence failed to agglutinate paratyphoid A 1–25 when examined again on the average 4 weeks later, and 23 out of 52 paratyphoid B cases examined 5·3 weeks after convalescence failed to agglutinate paratyphoid B 1–25, on the average 4·7 weeks later. In other words, had the examination been delayed on the average from about 6 to 10 weeks two-fifths of the paratyphoid cases would not have been diagnosed by the technique we employed.

One would naturally have expected that the paratyphoid agglutinins produced by a recent natural infection of some weeks' duration with presumably large numbers of living bacilli, would have outlasted the typhoid agglutinins produced several months ago by comparatively small doses of dead typhoid bacilli administered on two occasions only. The fact that typhoid vaccines are made from strains of bacilli selected partly on account of the capacity to form a large amount of inoculation agglutinins may help to explain this phenomenon. Our results, however, confirm the statement of the Medical Research Committee's leaflet that the titre of paratyphoid "infection" agglutinins eventually falls "*below* the persistent base line of typhoid agglutination of inoculated persons." Peruzzi,[12] who recently examined the blood of a number of officers 30 months after they had either suffered from typhoid or had been inoculated against that disease, found that the infection agglutinins were *absent* in 63 per cent., while the inoculation agglutinins were *present* in 75 per cent.

(*c*) The rise in titre in about 5 per cent. of paratyphoid and typhoid cases was probably due to experimental error, except in two cases paratyphoid B, series 11 (intermittent carrier) and 38, which rose from 1–50 to 1–250.

3. *Co-agglutination* is in all probability not responsible for any of the paratyphoid titres in Group I.; still, its possible occurrence must be considered from three standpoints:—

(*a*) *Paratyphoid A producing co-agglutinins for paratyphoid B and vice versa*.—There was no evidence of this; in fact, we have only found three cases agglutinating both paratyphoid A and B, and in two of them the agglutination was probably due to a dose of mixed vaccine.

(*b*) *Typhoid producing co-agglutinins for paratyphoid A or B*.—There was no evidence of this; in fact, the sera of 25 convalescent enterics with a typhoid titre ranging from 1–250 to 1–5000 all failed to agglutinate paratyphoid A or B 1–25.

(*c*) *Paratyphoid A or paratyphoid B producing co-agglutinins for typhoid*.—Our figures demonstrated that a recent paratyphoid B infection certainly raised the titre of typhoid inoculation agglutinins; thus the typhoid titre was 250 or more in 51 per cent. of the P.T.B series, whereas the same titre was reached in only 14 per cent. of the P.T.A series, and 20 per cent. of 162 cases which agglutinated neither paratyphoid A nor paratyphoid B (see Group III.). Dreyer [3] also found that active paratyphoid infection might produce a rise in inoculation typhoid agglutinins, "though it was usually much less evident in paratyphoid A infections than in paratyphoid B infections."

If the paratyphoid B infection raises the titre of the typhoid inoculation agglutinins, one would expect the subsequent fall in 84 per cent. of the paratyphoid B titres to be accompanied by a similar fall in typhoid titres. In reality the typhoid titres in the paratyphoid A infection fell in 14 per cent., but those in the paratyphoid B infection fell in only 18 per cent. between the two tests. This remarkable discrepancy can be explained by observations made by Dreyer and Walker,[13] who found that "if an animal which has been immunised some weeks or a month or two before with a particular micro-organism be inoculated with a non-lethal dose of a vaccine prepared from some other micro-organism, its agglutination titre for the first micro-organism exhibits a new rapid rise of greater or less extent and pursues a curve similar to the ordinary inoculation curve." In other words, under the stimulus of the paratyphoid B infection the typhoid agglutinins have in most cases repeated the *sudden* rise and *very slow* fall which they underwent after the original typhoid inoculation. This increase is "due to a reaction of a general non-specific character affecting cells and tissues which are already engaged in the formation of specific agglutinins and causing them to take on the increased activity."[3]

4. We believe a paratyphoid titre as low as 1–25 is probably always diagnostic of paratyphoid infection in convalescents, at any rate provided that paratyphoid vaccine had not been used—first, because such titre was never present in the various controls, and, secondly, because in many of the cases in Group I. the titre of 1–25 disappeared without any corresponding change in the typhoid titre.

We found the titre of paratyphoid B agglutinins as a rule much higher than that of paratyphoid A; thus only 11 per cent. of the latter cases reached a maximum of 250, but 30 per cent. of the former reached from 250 to 1250, including two of 2500, though these last were tested at the very beginning of convalescence. If the results were expressed in "standard agglutinin units" the paratyphoid B titre would be still higher—e.g., one batch of emulsion gave with a titre of 250 paratyphoid A 70 units, paratyphoid B 93 units. We conclude, therefore, that a paratyphoid A titre of 1–25 is more significant than a paratyphoid B titre of the same amount. Dreyer, as stated before, believes a titre of even 1–10 is diagnostic of paratyphoid A.

Our figures of "infection" agglutinins confirm those of Dreyer, also of Coppinger and Gibson[2] with "inoculation" agglutinins. These observers found independently that after inoculation with a mixed paratyphoid vaccine the paratyphoid B titre was much higher than the paratyphoid A titre. Castellani's[1] figures show that after his vaccine the titre of paratyphoid A and B is practically the same. Harvey and Gibson,[3] on the other hand, found the titre of paratyphoid A higher and more persistent than paratyphoid B, but they inoculated rabbits. The relative position, however, of the paratyphoid A and paratyphoid B titre in a given series of cases will depend not only on the quantity of specific agglutinins and their persistence when formed, but also upon the relative agglutinability or *sensitiveness* of the emulsions used to measure those agglutinins.

*Paratyphoid carriers.*—The relation between paratyphoid carriers and paratyphoid agglutinins was shown in two cases. The first was that of a chronic paratyphoid B carrier. The paratyphoid B titre has remained steady at +1–500 for 12 weeks, whereas the typhoid has fallen from + 1–1250 to 500 in the same time. The second was that of an intermittent carrier who has shown remarkable variations in titre: 5 weeks after convalescence the titre was 1–125; in 17 weeks it had disappeared, but with the reappearance of paratyphoid bacilli in the excreta it again rose to 1–125.**

### *The Relative Frequency of Paratyphoid A and Paratyphoid B.*

All the statistics from the Near East, whether from cultures or serum tests—the results of the two methods will not necessarily coincide—show that paratyphoid A was much more frequent than paratyphoid B (Bassett Smith,[13] Ledingham and Penfold,[10] Willcox[16]). We found the reverse, 36 cases paratyphoid A and 74 paratyphoid B. The discrepancy may be partly explained by supposing that the paratyphoid B agglutinins, on account of their higher original titre, persist longer than those of paratyphoid A, though we have no evidence of this. There is, however, a very simple explanation. Willcox, referring to Archibald's figures, which give the largest number of typhoid and paratyphoid cases proved by blood cultures from the Near East, says that "up to the end of October, 1915, paratyphoid B was much more frequent in occurrence than A, but after the end of October paratyphoid A was much more common."

We have arranged 107 of our cases in which the date of onset of paratyphoid could be approximately fixed, and the results are given in Table II.

TABLE II.

| Date of onset. | No. of cases. | Ratio of P.T. A to P.T. B. | |
|---|---|---|---|
| August and September ... | 58 | 1·0 | 4·9 |
| October ... ... ... ... ... | 16 | 1·0 | 1·7 |
| November ... ... ... ... | 18 | 1·2 | 1·0 |
| December and January ... | 15 | 1·5 | 1·0 |

When it is remembered that all our cases were diagnosed with exactly the same technique, and under the same conditions, the results confirm Willcox's statement in a striking manner. It appears that paratyphoid B infections, though rare, are much commoner than paratyphoid A infections in Europe, especially in England, whereas in India the reverse obtains.[11] The change in the incidence of these two diseases among the troops in the Eastern Mediterranean last October is probably due to the fact that a large number of battalions from India were brought there, some of which would be infected with paratyphoid A.

### GROUP II.—*Cases Failing to Agglutinate Typhoid, Paratyphoid A, or Paratyphoid B in 1–25 at the First Examination.*

Twenty-eight cases comprised this series. The agglutination reaction was tested on the average 7 weeks after the onset of convalescence; maximum 12 and 9 weeks, minimum 1 and 2 weeks. Twenty-six had been inoculated against typhoid between May, 1914, and December, 1915; the average time from inoculation was 10 months; 1 refused inoculation and 1 was not questioned, 2 stated that they were also inoculated against paratyphoid. Two were diagnosed as paratyphoid and 1 as "paratyphoid A and B."

*Comment.*—The majority of these patients probably never had typhoid, because even if the inoculation agglutinins had disappeared in about 10 months it is unlikely that the typhoid infection agglutinins would have disappeared in about 7 weeks, especially as 8 of the cases were tested 3 weeks or less after the onset of convalescence. Again, blood cultures appear to have been made in only 1 case and serological tests in 8 cases. Lastly, 12 gave a history of, and were first diagnosed as, dysentery, and 1 as malaria.

### GROUP III.—*Cases Agglutinating Typhoid Only.*

It has already been pointed out that a serological diagnosis of typhoid cannot be made in those recently inoculated unless the titre of the typhoid agglutinins is estimated on two occasions at least, if not three or more, separated by short intervals. Unfortunately it was only possible to do this in 133 out of the 162 cases in this group. The results are taken collectively and are summarised; in a few instances, however, individual cases have been alluded to. The results are arranged in three series: (*a*) 95 cases examined on three or more occasions; (*b*) 38 cases examined on two occasions only; and (*c*) 29 cases examined only once. Those of the first two series are given in Table III.

TABLE III.—*Cases Agglutinating Typhoid Only, showing the Percentage in which the Titre was Stationary, Rose, or Fell between the First and Last Examinations.*

| — | Stationary % | Weeks from convalescence. | Weeks between tests. | Rise % | Weeks from convalescence. | Weeks between tests. | Fall % | Weeks from convalescence. | Weeks between tests. |
|---|---|---|---|---|---|---|---|---|---|
| Series A, 95 cases | 67·4 | 8·9 | 4·7 | 9·4 | 7 | 4·3 | 23·2 | 7 | 5·8 |
| Series B, 38 cases | 57·8 | 5·9 | 3·8 | 10·6 | 7·5 | 3·5 | 31·6 | 7·4 | 3·4 |
| Series A & B, 133 cases ... ... | 64·7 | 8·1 | 4·4 | 9·8 | 7 | 4 | 25·5 | 7·1 | 4·8 |
| Typhoid in P. A & P. B table ... | 78·2 | 6·2 | 4·4 | 5·2 | 7 | 5·2 | 16·6 | 8·1 | 6 |
| P. A & P. B table 110 cases ... ... | 14·5 | 8·1 | 5·9 | 3·6 | 7·7 | 4 | 81·9 | 6·3 | 4·5 |

*Comments.*—1. The titre (Series A and B) on the first examination was 500 to 2500 in 2·3 per cent., 250 in 19·6 per cent., 125 in 36·1 per cent., 50 in 27 per cent., and 25 in 15 per cent. 2. In 64 per cent. (Series A and B) the typhoid titre was stationary between the two examinations, which is strong evidence that the majority never had a recent typhoid infection. This is corroborated by the fact that the percentage in which the titre was stationary is only a little less than that of the typhoid titres in the *paratyphoid* series, where we believe a recent typhoid infection had rarely if ever occurred. It forms a marked contrast to the small percentage of stationary paratyphoid titres in the same series, where we believe a recent paratyphoid infection had almost always, if not invariably, occurred. 3. Thirty-four cases, or 25 per cent., showed a fall in titre. They were arranged according to the number of weeks the first examination was made after convalescence: 46 per cent. fell in the first 4 weeks after convalescence, 29 per cent. in the second 4 weeks, and 25 per cent. from 9 to 18 weeks. In other words, had the first examination been made sooner a larger proportion of cases would most probably have shown a fall in titre which could be evidence of a recent typhoid infection. This fall in titre, however, is not really strong evidence of a recent typhoid infection, because only 7, i.e., 5·3 per cent., fell as much as 2 tubes, whereas in the paratyphoid

TABLE IV.—*Typhoid Agglutinins.*

| — | Titre. | Weeks. | Titre. | Titre. | Weeks. |
|---|---|---|---|---|---|
| 1 | 250 | 4 | 125 | 50 | 9 |
| 2 | 250+ | 4 | 125 | 50 | 11 |
| 3 | 250 | 7 | 125 | 25 | 13 |
| 4 | 250 | 3 | 125 | 50 | 12 |
| 5 | 50 | 6 | 25 | 0 | 15 |
| 6 | 50 | 4 | 25 | 0 | 7 |
| | Average ... ... | 4·7 | | Average ... | 11·2 |

** In the Medical Research Committee pamphlet it is stated, "A *non-inoculated* 'carrier' (typhoid or paratyphoid) will normally show no important change in the titre of his serum on repeated examination at short intervals." It is evident that a carrier may show an important change in titre; perhaps, however, the word "normally" excludes intermittent carriers.

series 48 per cent. fell 2 or even more tubes in approximately the same time. Six cases (Series A) showed a steady fall in the titre of at least 2 tubes, which, as they had all been inoculated against typhoid more than a year before, is, in our opinion, conclusive evidence of a recent typhoid infection.

The seventh (Series B), first examined six weeks after convalescence, showed a titre of 50, which fell to 0 in seven weeks; this also was probably a case of typhoid infection. Of the remaining 27 of both series all fell only 1 tube. As the fall was so slight, it is in the majority of cases most probably due to a gradual normal disappearance of inoculation agglutinins, or to technical error, and not to active typhoid infection.

4. Thirteen, or 10 per cent., showed a rise in titre; in 3 (Series A) the titre rose steadily, viz.:

No. 8 titre 25 (four weeks after convalescence), 125 (5), 250 (7), 50 (9), 50 (10). Inoculated against typhoid October, 1914. The emulsion denominator was 5·6 for the first test and 7·7 for all the rest.

No. 9 titre 250 (9 weeks after convalescence), 500 (10), 1000 (11), 500 + (13), 500 (15). Inoculated against typhoid October, 1914. The emulsion denominator was 7·7 for all tests.

No. 10 titre 50 (6 weeks after convalescence), 125 (7), 125 (8), 250 (10), 500 + (14), 500 + (16). Inoculated against typhoid May, 1915. The emulsion denominator was 5·6 for the first test and 7·7 for all the rest.

It will be noted that in Nos. 8 and 9 the typhoid titres steadily rose and subsequently fell; in No. 10 there was a steady rise and no subsequent fall in 16 weeks. In our opinion this change in titre, although it was unassociated with any pyrexia, is strong evidence of recent typhoid infection. It suggests the possibility that the patients are carriers, at any rate, in case 10, but no typhoid bacilli have been isolated after at least four examinations of the excreta. If these cases were typhoid, then the typhoid agglutinins in typhoid convalescents do not "*always* (italics ours) show a definite diminution of titre in the course of a week or two," as one is led to infer from Dreyer's statement.[4] Of the other 10, 3 rose 2 tubes; in 1 case (No. 11) probably from infection, in 2 (and the remaining 7 rising one tube) probably from technical error or change of emulsion denominator.

5. Other remarkable evidence strongly suggests that very few in this group really had typhoid—viz., the typhoid titre reached 250 or more in only 20 per cent. of the cases, whereas it reached this limit in 51 per cent. of the paratyphoid B series, the rises being due to co-agglutination and not typhoid infection. One would naturally expect, had typhoid infection really occurred, that the titre would have reached at least 250 in far more than 50 per cent. of the cases. Dreyer[6] found the titre greater than 1-500 in 7 out of 8 consecutive cases of active typhoid infection, even though the patients had never been inoculated.

*Series C.*—Of the 29 cases examined once 3 agglutinated 1-500, 6 1-250, and the remainder varying from 1-125 to 1-25.

*Summary.*—We have briefly summarised the results, though the data are sometimes incomplete. In only 11 cases was there a strong probability, if not a certainty, of recent typhoid infection. Even if we assume that as many as half the remaining 27 cases in which the titre fell one tube were also infected, the total reaches 25 cases (11 + 14)—i.e., under 10 per cent. of the whole 300 examined. This forms a marked contrast to the 110 or 37 per cent. of cases agglutinating paratyphoid; two or three of the latter, however, may have been infected with typhoid as well. The number of typhoid infections would probably have slightly increased if the 29 cases (Series C) had been examined at least twice.

The number of typhoid infections would also have been increased if the first examination had been made earlier than at an average of seven weeks after the beginning of convalescence, but so would the number of paratyphoid infections. Our proportion of 1 typhoid case to not less than about 4 or 5 paratyphoid cases is corroborated by Archibald's figures from blood cultures—19 typhoids to 122 paratyphoids, and our own from the excreta of convalescents—2 typhoids to 12 paratyphoids.

Last summer the diagnosis of typhoid was often made in the Eastern Mediterranean on insufficient clinical and bacteriological evidence.

(*a*) Patients with continued "pyrexia of unknown origin" were called "enteric" just as they were called "influenza" in England or "malaria" in India. The clinical diagnosis was especially difficult because fully a third were suffering from acute dysentery. There have been cases labelled "convalescent dysentery" from the Eastern Mediterranean at the Tropical School Auxiliary Military Hospital, Liverpool, under the care of Professor J. W. W. Stephens and Captain Ll. A. Morgan, R.A.M.C., which have developed "pyrexia of unknown origin" lasting days or weeks; but there was no serological or bacteriological evidence of typhoid or paratyphoid infections.

(*b*) The bacteriological evidence was insufficient because out of 154 patients of the 162 in this group who were questioned only 8 per cent. stated that blood was taken from their arm, i.e., for cultures, an operation likely to be remembered. Only 40 per cent. had blood taken from their finger or ear, i.e., for serum reaction, though a *single* examination is perfectly useless in the diagnosis of typhoid among the inoculated. A great improvement has now been made in the bacteriological diagnosis, for in a large series of "enteric" cases not included in this paper, which have recently arrived from the Eastern Mediterranean, practically all of whom contracted the disease this year, 34 per cent. gave us a history of blood cultures and 45 per cent. of serological tests.

### *Summary and Conclusions.*

1. The serum reactions to typhoid, paratyphoid A, and paratyphoid B of 300 consecutive recently convalescent "enterics" from the Eastern Mediterranean have been tested by Dreyer's technique and with emulsions supplied by the Oxford Standard Laboratory, through the agency of the Medical Research Committee.

2. After making about 3000 tests of these and other cases we find the emulsions most satisfactory, giving quite clear and definite readings, and the technique so simple that it can easily be mastered by an intelligent attendant. The method is accurate, the margin of error small, and eminently suitable for routine work on a large scale. It is essential, however, to have the same intensity of artificial illumination by day and night for reading the titres. The only practical difficulty—viz., that of obtaining sufficient blood—was overcome by instructing the ward sisters how to fill specially made Wright's capsules.

3. Control sera of soldiers inoculated against typhoid, but suffering from dysentery or surgical diseases, failed to agglutinate either paratyphoid emulsions, but the serum of every convalescent, 12 in all, excreting paratyphoid A or paratyphoid B bacilli agglutinated the corresponding emulsion only in titres ranging from 25 to 250.

4. One hundred and ten, or 37 per cent., of the cases tested agglutinated paratyphoid emulsion. 36 agglutinated paratyphoid A (titre from 25 to 250) and 74 paratyphoid B (titre from 25 to 2500). They were first tested about 7 weeks after the onset of convalescence. As none, with 3 doubtful exceptions, had been inoculated against paratyphoid, almost all, if not all, had a recent paratyphoid infection. This is confirmed by the fact that 83 cases were tested at least twice, and the paratyphoid titres, presumably from "infection," fell during 4 weeks in 82 per cent.; 48 per cent. fell markedly; 43 per cent. completely failed to agglutinate at the last test—i.e., would never have been recognised as paratyphoid had the first test been delayed from about 7 to 11 weeks after the onset of convalescence. Occasionally the fall in paratyphoid titre was rapid at first and then slower or ceased altogether. The typhoid titre, presumably from "inoculation," fell in only 17 per cent. of cases; only 1·4 per cent. fell markedly.

5. The remarkable diminution and frequent disappearance of the paratyphoid "infection" agglutinins which usually occurred formed a marked contrast to the stationary typhoid "inoculation" agglutinins. This is partly explained by supposing that the typhoid vaccines were made from strains of bacilli specially selected on account of their capacity to form quantities of "inoculation" agglutinins.

6. *Co-agglutination.*—(*a*) Between paratyphoid A and B or *vice versa* co-agglutination did not occur with the Oxford emulsions, in convalescence at any rate; only 3 sera out of 600 have agglutinated A and B simultaneously; in 2 paratyphoid vaccine had been used. (*b*) Typhoid infection or vaccine produced titres from 250 to 5000 without agglutination of paratyphoid. (*b*) Paratyphoid B infection, though not paratyphoid A infection, certainly raised the titre of typhoid inoculation agglutinins. It was remarkable, however, that the paratyphoid B titre usually fell while the typhoid

persisted; apparently the paratyphoid B infection stimulated the tissues already engaged in the formation of typhoid agglutinins to repeat the sudden rise and gradual fall which followed the typhoid vaccine.

7. The paratyphoid A titre averaged a lower level than that of paratyphoid B after infection and after vaccine, partly perhaps because the paratyphoid A emulsions used to demonstrate the presence of agglutinins were relatively less sensitive. Consequently a low paratyphoid A titre is the more significant; Dreyer, in fact, states that an agglutination of 1–10 paratyphoid A is diagnostic.

8. In a persistent paratyphoid B carrier the paratyphoid titre showed no change in 4 months, whereas in an intermittent paratyphoid B carrier the titre varied considerably.

9. Our serological tests independently confirm what Archibald found by blood cultures—viz., that in the Eastern Mediterranean paratyphoid B infections were commoner than paratyphoid A until November, after which the reverse obtained. This change in incidence was probably due to the introduction of paratyphoid A carriers with the battalions from India.

10. Twenty-eight cases—i.e., 9·3 per cent.—failed to agglutinate typhoid, paratyphoid A, or paratyphoid B 1–25 when tested about 7 weeks after the onset of convalescence; all but 2 had been inoculated against typhoid. The majority probably had never had typhoid, partly because one-third were tested 3 weeks or less after convalescence, and blood cultures appear to have been made in only one instance.

11. One hundred and sixty-two cases agglutinated typhoid alone, and were examined on the average 8 weeks after the onset of convalescence. Of 133 examined at least twice 11 showed a marked fall or rise in titre, demonstrating that almost all, if not all, had a recent typhoid infection. But even including doubtful cases, not more than 10 per cent. of the 300 showed evidence of recent typhoid infection. This percentage, however, would have been increased had the first examination taken place sooner, but so also would the percentage of paratyphoid cases.

12. The number of typhoid cases is evidently small because (*a*) a fall in titre occurred in only 25 per cent. (5 per cent. marked). This agrees with the behaviour of the typhoid "inoculation" agglutinins in the paratyphoid group which fell in 17 per cent. (1 per cent. marked), and contrasts strongly with that of the paratyphoid "infection" agglutinins which fell in 82 per cent. (48 per cent. marked). (*b*) The typhoid agglutinins reached a titre of at least 250 in only 20 per cent. of cases. This is exceedingly small if typhoid infection had usually occurred, for the typhoid "inoculation" agglutinins reached the same limit in 51 per cent. of the paratyphoid B series (though this high level is presumably due to co-agglutination), and in 14 per cent. of the paratyphoid A series.

13. The diagnosis of typhoid in the Eastern Mediterranean last summer was less reliable than at home because pyrexia of unknown origin is frequent in hot climates; because fully a third of the cases were suffering from acute dysentery; and, lastly, because in our experience it was only controlled by blood cultures in about 10 per cent. Serological controls were carried out in 40 per cent., but such are useless and misleading in the "inoculated" unless repeated at intervals, and there is no evidence that this was done.

14. The diagnosis as "enteric" of cases not suffering from these diseases vitiates treatment and discredits prophylactic vaccination, while those who recover are regarded as potential bacillary carriers, and prevented from returning to active service for months.

15. The prophylactic use of mixed paratyphoid vaccines will undoubtedly increase the difficulty of diagnosing paratyphoid, as typhoid vaccine has done in the case of typhoid. The difficulty will be greatest in those mild cases which occur, especially in the partly protected, where the infecting bacteria cannot be demonstrated. Repeated serological tests will be of great assistance in the diagnosis. The most suitable method for routine work in war-time is Dreyer's with the Oxford emulsions. It possesses the additional advantage of being a successful attempt to standardise the agglutination tests, and thereby make the results from different laboratories strictly comparable.

16. As far as our opportunities have permitted, we have confirmed all the statements of the Medical Research Committee's leaflet, with one minor exception.

*Continued at foot of next column.*

# ACUTE INTESTINAL OBSTRUCTION.

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THE following notes of cases of acute intestinal obstruction I hope will be of interest. They range over a considerable area of time. Some of the causes are common, some rare, but in dealing with this disease the more uncommon conditions should not be lost sight of, as in Cases 1, 3, 4, and 6. The chief factors spelling success are, first, early operation, and, secondly, one or more enterotomies to reduce toxæmia.

CASE 1. *Enterospasm.*—Female aged 31. There was a history of her being struck on Christmas day. Violent abdominal pains followed. I saw her in consultation at 10 P.M. on Jan. 1st. All the symptoms of acute intestinal obstruction were present, rapid pulse, vomiting, and visible peristalsis. She was moved to the hospital in an ambulance, and two hours later I opened the abdomen in the median line. 3 feet of collapsed ileum close to the ileo-cæcal valve was found. The remainder of the intestine, both large and small, was examined. No band, stricture, or other obstruction noticed. There was no peritonitis. Appendix and pelvic organs were healthy. The case was regarded as an enterospasm and the abdomen closed. Belladonna was freely given. The patient did not improve. The abdomen became more distended. On Jan. 5th (four days later) I reopened the abdomen and found that the collapsed ileum, which measured 3 feet at the first operation, was now reduced to 12 inches. Multiple enterotomies gave relief to several pints of intestinal contents and the abdomen was closed. A free action followed a few hours later in response to a turpentine and sulphate of magnesia enema. The patient made a rapid recovery and was confined, I am told, lately, and is at present in good health.

CASE 2. *Adherent ileum after appendicectomy.*—Female aged 25. Twelve months ago was operated on for appendicitis. She was admitted into hospital for acute intestinal obstruction. The old scar was excised and the peritoneal cavity entered at the upper angle. A loop of intestine, which proved to be the ileum, was found to be adherent to the lower angle, producing an acute kink. This was easily separated, the visceral coat of intestine repaired, and dropped back. Good recovery followed, as the case was sent to hospital early before toxæmic symptoms developed.

CASE 3. *Appendix strangulating ileum.*—Female aged 46. This case I saw in October, 1915. The patient was on the operating table at the East Cornwall Hospital, Bodmin, and was under the care of Dr. Arthur G. Salmon, suffering from acute intestinal obstruction. She was thin, the abdomen was very distended, peristalsis was visible, and the vomit was fæcal. I opened the abdomen through a central incision. Large coils of plum-coloured small intestine at once protruded. This was all wrapped in a warm towel and search made. A tight band was seen encircling a large portion of the mesentery, which, on separation, proved to be the appendix. This was removed, the distended gut emptied by enterotomy, and the stump of appendix buried in the cæcal wall. The intestine rapidly improved in colour, and the abdomen was closed. The patient left the hospital in good health three weeks later.

The previous history of this case is interesting. Twenty-six years ago (May, 1890) Dr. Salmon was called to her and found her in a state of profound collapse. No vomiting or signs of hæmorrhage were present. After 60 hours the patient recovered. In April, 1891 (11 months later), the same symptoms recurred with rapid recovery. Two weeks later she complained of cutting pains during micturition, and the

*Continued from preceding column.*

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right temporal bone of a three months' fœtus was removed per urethram, where it was wedged. Subsequently the clavicle, femur, and other fœtal bones were removed. The ribs came away without assistance. The patient continued to pass fœtal bones occasionally for another 12 months. She regained her normal health, but had occasional attacks of sickness. Dr. Salmon adds, in the notes from which this previous history is compiled, that the attacks of collapse for which he first saw her probably coincided with the bursting of the ectopic gestation sac into the bladder. The fœtal bones were encrusted with phosphates, and he considers it a wonderful performance of nature to rectify a perilous condition.

I am much indebted to Dr. Salmon and Dr. R. B. Anderson for their help and notes in this case.

CASE 4. *Appendix nipping ileum.*—A child aged 2. This case was thought to be an acute intussusception. The child was passing blood and mucus. No lump could be felt and pain was chiefly on the *left* side. Vomiting was constant. The parietes were incised over the right rectus, and the peritoneal cavity entered through a 2-inch incision in the posterior sheath and peritoneum. On passing in two fingers a tight cord was felt between the right iliac fossa and the brim of the pelvis. This was the appendix. A loop of ileum (about 9 inches) was tightly nipped beneath it. The appendix was removed and good recovery followed.

CASE 5. *Obturator hernia.*—Female aged 72. A feeble old woman admitted into hospital with acute intestinal obstruction. The abdominal parietes were so thin that coils of intestine presented a curious appearance. No signs of external hernia were found and rectal examination was negative. A small incision was made in the left linea semilunaris at the lower third, with a view to explore the sigmoid. This was found collapsed. The incision was closed. A central sub-umbilical incision was then made, collapsed small gut was seen, and, on tracing this down towards the pelvis, it was found adherent to the obturator foramen on the right side. Only a small portion of the lumen was nipped. This was released and the serous coat of intestine repaired with Lembert's suture. The patient made a good recovery. The bowels acted in a few hours and an attack of diarrhœa followed.

CASE 6. *Gangrenous Meckel.*—A child aged 2½ years. This case was seen in consultation with Dr. M. Aikman. The child was vomiting and had had no action of the bowels for three days. The abdomen was distended and rigid. I regarded it as a case of acute appendicitis. The patient was admitted to a nursing home the same day. The abdomen was opened vertically over the outer half of the right lower rectus abdominis (Battle's incision). The cæcum and colon were collapsed, an inflamed and partially gangrenous Meckel's diverticulum was found attached to the ileum and passing upwards and inwards towards the umbilicus. A loop of dark-coloured ileum lay beneath it, tightly strangulated. The diverticulum was dealt with and the child made a good recovery. In this case the large intestine was shrunken to the size of a lead pencil and I had serious doubts as to the possibility of it regaining its function.

CASE 7. *Ruptured uterus with gangrenous intestine.*—Female aged 41. The history of this case is brief. The patient was admitted to the Bodmin Hospital in a collapsed condition, having been brought a considerable distance by motor-car. She was confined 48 hours previously and great difficulty was experienced in delivery. Intestine was protruding from the vagina. No action or flatus had passed. The abdomen was distended. Vomiting was urgent. I saw her a few hours later and, assisted by Dr. Anderson and Dr. Salmon, opened the abdomen. The peritoneal cavity was full of blood, the uterus was ruptured posteriorly, the rent being 3 inches long. Subtotal hysterectomy was performed, leaving both ovaries and the stump covered in the usual way. The pelvis was then examined, and 2 feet of small intestine was found in a gangrenous condition, quite separated from its mesentery. This was rapidly excised, division extending well into normal gut, and joined up by simple suture. The mesentery was laced up, and the parietes united in layers. No rise of temperature followed, the bowels acted well in the course of a few days, and the patient left the hospital quite well in three weeks.

CASE 8. *Carcinoma of colon and ovarian cyst with twist of pedicle.*—Female aged 23. This patient was seen in consultation with Dr. R. Simpson. She had suffered for the last few days from constipation and had some pain in the left iliac fossa. This was dull on percussion, the right side being resonant. Enemas and aperients failed to produce any relief and she was admitted into a nursing home. On opening the abdomen an ovarian cyst with a twisted pedicle occupied the left iliac fossa extending upwards towards the left side. This was removed without tapping. The cæcum was tightly distended. It was necessary to extend the incision upwards nearly to the ensiform cartilage in order to trace the large intestine. A malignant growth was found at the hepatic flexure, completely blocking the lumen of gut. A mass of glands was present in the mesocolon. Relief to obstruction was given by a cæcostomy and the abdomen closed, and a few weeks later ileo-colostomy was performed. The patient left the nursing home in six weeks, the bowels acting well, and health gradually improving. The ovarian cyst was of semi-solid consistence. Dr. W. L. Pethybridge reported that the ovarian tumour was an adeno-carcinoma, and probably primary, the growth in the colon being secondary.

CASE 9. *Hernia; reduction en masse.*—Male aged 47. The patient was sent to the South Devon Hospital by Dr. H. Davis, of Callington, for acute intestinal obstruction. The man was very ill, vomiting everything taken by mouth. No flatus had passed for some days. On examination a small lump, the size of a walnut, was felt just above the internal abdominal ring on the left side. No external hernia was found, and examination of the rectum revealed nothing abnormal. The small lump referred to felt like, and was thought to be, a gland. Incision was made vertically over this, and a small knuckle of gut was found tightly nipped. This was dealt with and good recovery followed. I consider that the man had had an inguinal hernia which he had reduced *en masse*.

CASE 10. *Omental adhesion.*—Male aged 47. This patient was a powerful, well-built man, sent by Mr. T. A. King, of Bude, suffering from acute intestinal obstruction. He was vomiting everything taken by the mouth, and there had been no action for five days. The abdomen was tightly distended. He had been in hospital six years ago and had had three operations, one being a colotomy which was afterwards closed. Unfortunately no notes were available. There were three scars—one long median, extending beyond and obliterating the umbilicus, and one right and left inguinal. The central site was chosen, and on opening the peritoneum an enormous bulk of large intestine presented; this was easily turned out into a warm towel. A long, rope-like cord of omentum was attached to the upper angle of the incision. This was tied off to the extent of 7 inches. An enterotomy of the colon evacuated a quart of liquid fæces, and the small incision was closed. A similar opening was made in the distended small intestine, with relief to a quantity of gas. These two enterotomies permitted the easy return of intestine. The appendix was normal. The abdomen was then closed, the bowels acted naturally within a few hours, and he left the hospital quite well in three weeks. I do not know what the patient's original condition was for which a colotomy was performed, but the omental adhesion was the cause of his obstruction when he came under my care.

In the treatment of acute intestinal obstruction I cannot urge too strongly the importance of early surgical interference. If this is objected to by the patient, or by his or her relatives, the danger of delay and lessened chance of a satisfactory result should be clearly pointed out. Naunyn (quoted in Keen's Surgery, vol. iv., p. 645) collected 288 cases of acute intestinal obstruction which showed recovery in 75 per cent. when operated on the first or second day, but falling to 35 per cent. if delayed to the third day. I quite admit the occasional difficulty of diagnosis, but surely it is safer to open the abdomen when acute symptoms are present than to wait.

Plymouth.

## IMMOBILITY AFTER JOINT INJURY.

BY SIR JOHN COLLIE, M.D. ABERD.,
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MANY men who have had accidents at or in the neighbourhood of a joint draw sick allowances from industrial clubs, insurance companies, and the State long after all inflammation has subsided, and when there is no apparent reason why pain should be complained of. The suspicion of malingering not unnaturally arises in the mind of those who have to pay, and a medical opinion is sought where it is assumed there is a *prima facie* case of fraud. The vast majority of these cases are, however, not fraudulent, but are the result either of mismanagement by those in charge of the case or of the patient having adopted his own treatment.

At one time it was almost the universal practice of the medical profession to keep joints fixed for many weeks after the reduction of a dislocation and to allow splints to remain on fractured limbs until the muscles had wasted and strong fibrous bands had fixed the adjacent joints; this bad practice is still common. Large numbers of these cases subsequently apply to bonesetters, and many are cured.

It is scarcely fair to blame the public if, not having obtained relief from regular practitioners, it deliberately takes the small risk of having adhesions broken down and resorts to irregular practitioners for this purpose. They occasionally come across unreduced dislocations, but since the discovery of X ray photography their number must be few. Perhaps more frequently bonesetters replace dislocated semilunar cartilages where regular practitioners have failed.

Many believe that the bonesetter lives by fraud and chicanery, that every joint he is asked to treat is said to be "out," that he gives a mysterious twist of the limb, surreptitiously cracks his fingers in the neighbourhood of the joint, and, heigh presto! an "unreduced dislocation" is cured. Now, in most cases the patient is cured, but not by the reduction of a dislocation. The swift, accurate, and definite movements are those necessary to break down the fibrous bands that always form round joints which have become stiff for want of passive movements.

Many bonesetters administer an anæsthetic daily for a few days after the initial operation to overcome the muscular resistance. People who go to bonesetters do not mind the risk and the expense, but a second anæsthetic is quite unnecessary, for carefully regulated exercises, although a little painful at first, are all that are required to complete the cure. I have seen a large number of joints both in civil and military practice, some of them temporarily and many permanently disabled because the surgeon in charge has failed to appreciate that immobilisation of a joint is inevitably followed by adhesions. It is not sufficiently recognised that the longer adhesions are allowed to remain the greater the risk is of permanently impaired function. This is especially common where a shoulder-joint has been dislocated or where a knee-joint has been the subject of a mild form of traumatic synovitis.

Adhesions sometimes take place at a joint which has been fixed so short a time as three weeks. They may bind together the articular surfaces and the folds of the synovial membrane in the joint, or they may be entirely outside the joint. The surrounding tendons may become adherent to their sheaths as the result of teno-synovitis.

Adhesions form in the shoulder-joint in the capsular ligament over the bicipital groove—where an adventitious band is sometimes found in connexion with the sheath of the long head of the biceps—and over the deltoid bursa; at the elbow-joint from the tip of the internal condyle of the humerus, corresponding to the fan-shaped internal lateral ligament; at the knee the bands adhere to the internal semilunar fibro-cartilage and the internal lateral ligament.

When estimating the mobility of the shoulder-joint the scapula should always be fixed. After adhesions in the shoulder-joint have been broken down the arm must on no account be put in a sling. I find a very good method of inducing patients to extend the shoulder-joint is to place them face forwards against a closed door with the palms of the hands against the door. They are instructed to make both hands gradually creep up by muscular action of the fingers against the support of the door until the hands are well above the head. The gradual, slow, and comparatively painless upward gliding of the hands always produces a fascination in reaching a higher point, which has generally a very happy result. This movement is much more easily performed than raising the hands apart from the support of the door, for the strain on the deltoids is not so severe, and the upper extremity is raised partially by the assistance of the muscles of the forearm.

The after-treatment of accident cases for which the State, an insurance company, or an employer is responsible is always difficult to carry out. Amongst a certain class of employees there is a feeling of resentment against the employer, especially if, as sometimes happens, the injury is the result of want of proper care on the part of the employer—as, for instance, where a faulty rung of a ladder has been discovered to have been the cause of the accident. The patient, perhaps not unnaturally, thinks that it is his business to see that now the initial suffering is past he shall not be submitted to any further pain or inconvenience of any sort, and that if he does not fully recover his master must take the consequences. Apart from this short-sighted policy, it should not be forgotten that many of these people have already suffered much both physically and mentally as the result of their accident, and that the responsibility for the fact that an operation for breaking down adhesions is necessary is not that of the master, the patient, or the insurance company, but comes a good deal nearer home than many members of our profession care to admit even to themselves.

Attempts are sometimes made to break down adhesions under nitrous oxide gas, but with it complete muscular relaxation cannot be obtained, and the results are unsatisfactory. I never advise men of the working class who are suffering from adhesions in or round a joint to submit to treatment in the *out*-patient department of a hospital. For although the operation itself is comparatively trivial, and it would appear at first sight to be one eminently suited for the out-patient ward, experience shows that subsequent to the operation the daily forced passive movements upon which success or failure depends cannot be secured in this way. The only satisfactory treatment for these cases is to obtain admission to hospital, and fortunately only a few days' stay is necessary.

The way not to succeed in a case of this sort is to send such a case to the out-patient department of a hospital, to have nitrous oxide gas administered sufficiently deep for a dental extraction, to have the limb bent as far as the opposing muscles will permit, and then to instruct the patient to attend as an out-patient at intervals to be massaged by a nurse two or three times a week. The anæsthesia is not sufficient, the operation cannot be complete, the patient may or may not attend for the massage, and in any case it will be useless, for the patient will assuredly not permit of any passive movements which are in the least painful at the hands of anyone except a surgeon.

Mr. Romer, who has made a special study of this subject, points out that when adhesions have to be broken down an anæsthetic should always be given, not so much for the purpose of avoiding pain as of ensuring the complete relaxation of the muscles, otherwise the muscles which will be involuntarily brought into action may be injured by the force necessary to break down the adhesions. He points out that sufficient muscular relaxation cannot be obtained by nitrous oxide gas, and that it should never be relied on. The elder Hutton, the bonesetter, necessarily performed his operations without an anæsthetic, and he overcame the resistance of the muscles by rotating the limb on its own axis for a considerable time. The rationale of this movement seems to be that by throwing the muscles out of their ordinary lines of action they are for the time rendered powerless.

When adhesions give way there is no mistaking the result of forcible movement—the loud crack or the less highly pitched crunch, or it may be merely a tearing sound, indicate to some extent to those who have much experience the duration of the adhesions. Pain which follows the operation is insignificant and seldom lasts more than an hour. The important point is that unless the medical man who undertakes this comparatively simple operation is prepared to carry out the *after-treatment* on scientific lines it is infinitely better for his patient and himself not to undertake it. Prior to the necessary passive movements of the joint, which should be commenced within a few hours of the operation, the muscles in the neighbourhood of the joint should be skilfully massaged. It must never be bandaged, and to apply a splint is folly. If the joint is not manipulated within 24 hours the ruptured adhesions will re-unite.

If the injury done to a joint were merely that fibrous bands formed, the damage done could be in most cases comparatively easily repaired by breaking down the adhesions. But prolonged immobility to a joint necessarily entails muscular wasting, which is the result partly of disuse and partly of nervous reflex action set up by the original injury to the joint. To restore the muscular wasting special simple exercises are always most useful. The ordinary physical exercises of the gymnasium instructor, so useful in health, are not suited for these cases. The anterior, middle, and posterior fasciculi of the deltoid, for instance, move the humerus in different directions, and it is obvious that if a few of the anterior fibres are lacerated the exercises useful for the development of all the muscles of the upper extremity, such as the use of dumb-bells, &c., cannot be appropriate.

Wharton Hood has pointed out that any movement which causes pain will not only be avoided, but whenever circumstances call for any approach to it the stronger portions of the muscle will be thrown "on guard" to protect the weaker

parts from going into action. Thus the exercise will fail. The secret of success in all these cases is to give the muscle very light work at first; for instance, in the case of the upper extremity the gradual lifting of a weight by means of a handle, rope, and pulley is more effective than forcible but indiscriminate movements. The weakened portion is coaxed, as it were, to take part in a light movement, whilst it would rebel to attempt even to lift a heavy weight. The size of the weight should be gradually increased.

The author whose views I have just referred to observes that a few days of such treatment "will generally suffice to bring the specially weakened portions of a muscle into line with the remainder, and to get rid of any pain which the earlier efforts may have caused. When this has been accomplished the muscle may be exercised more freely, and as a whole, and the weights employed may be increased. All that is necessary in the first instance is so to arrange the exercises as to furnish a movement in which the weakest part of the affected muscle must take its share, and to do this in such a manner that the movement in question is started, and in its course is facilitated by the descent of the weight which the opposite action has drawn up."

Porchester-terrace, W.

## EXTRACTION OF BULLET FROM MIDDLE MEDIASTINUM.

BY L. E. BARRINGTON-WARD, CH.M., F.R.C.S. EDIN., F.R.C.S. ENG.,

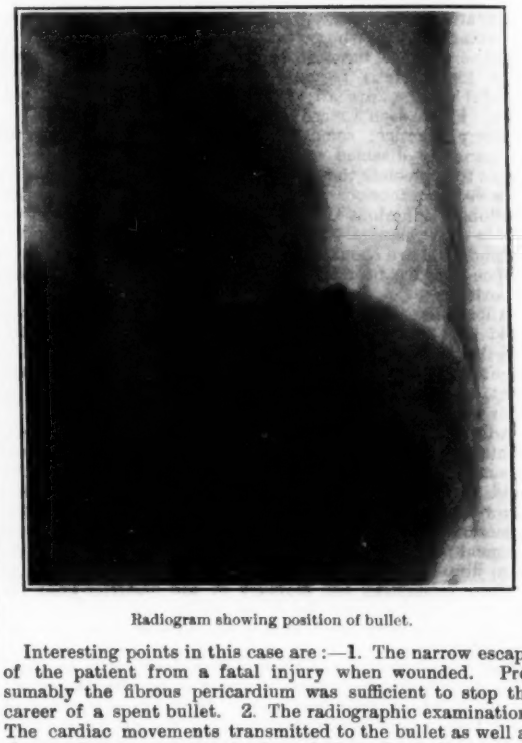
HONORARY SURGEON TO THE KING GEORGE HOSPITAL AND (WITH CHARGE OF OUT-PATIENTS) TO THE GREAT NORTHERN CENTRAL HOSPITAL AND THE HOSPITAL FOR SICK CHILDREN, GREAT ORMOND-STREET.

THE following case of bullet lying in close relationship to the pericardium presents several features of interest.

Private ——, aged 33, was wounded in France in September, 1915. The bullet entered the left side of the chest in the mid-axillary line. There was no wound of exit. He was detained in hospital for six weeks and the wound healed uneventfully. In February, 1916, he was passed fit for general service again and rejoined his regiment in France. He suffered from sharp pains in the chest with palpitation and shortness of breath on marching. Accordingly, in April, 1916, he was sent to hospital at E——. A radiogram of the chest was taken and the diagnosis was made of bullet in the pericardium. He was sent back to England as unfit for service and on April 28th was admitted to the Great Northern Central Hospital. On examination he appeared to be a healthy man with no symptoms while at rest. He stated that exercise gave him sharp pains over the præcordia, with attacks of breathlessness. There was a healed wound in the mid-axillary line in the seventh interspace. The heart and lung sounds were normal. A radiogram showed a bullet apparently lying in the pericardium near the left border of the heart just above the diaphragm. On screening, movements of the bullet due to cardiac and respiratory excursions were well seen. It was thought that the bullet lay in the pericardial cavity, possibly attached to the pericardial wall.

An operation was performed for its removal on May 9th. Dr. W. A. E. Dobbin administered chloroform with the Vernon Harcourt apparatus. An incision was made in the mid-line of the sternum from the level of the fifth costal cartilage downwards to the sixth costal cartilage, and then along the sixth costal cartilage outwards. The sixth costal cartilage was removed. The internal mammary was ligatured and the triangularis sterni muscle, which was poorly developed, divided. The left lung and pleura, which overlay the pericardium as far as the left border of the sternum, were pushed aside and the pericardial cavity was opened. It was intended, if more room was required, to reflect outwards a flap of the fifth, fourth, and third costal cartilages with the overlying soft parts. It was found, however, that the removal of the sixth costal cartilage gave a surprisingly good view, and through this incision it was possible to palpate thoroughly the heart and explore the pericardium. The bullet could not be felt. It then appeared likely that it was lying on the pleural side of the pericardium. The lung and pleura were gently separated off the pericardium and at a depth of about 4 inches from the surface the bullet was found adherent to the pericardium and also to the pleura and lung. It lay surrounded by a few beads of pus, with its long axis applied to the pericardium, apex forwards. The pleura was adherent to the lung in this situation and this fact undoubtedly prevented any extensive collapse of the lung. The bullet was extracted, the pericardium closed with fine catgut, the muscles were brought together, a small rubber tube was inserted superficially, and the skin wound was closed with Michel's clips. The anæsthetic was admirably taken throughout and no change in colour and no respiratory or cardiac embarrassment was noted except when the pericardium was pulled forward for suture. This traction on the pericardium caused slowing of the respiration.

Recovery was uneventful. The tube was removed in 24 hours, when some deficient movement of the left side of the chest was noted. The respiration rate rose from 26 before operation to 32 on the second day, and fell back to 24 on the fourth day after operation. Pulse and temperature were hardly affected. On the fifth day the skin clips were removed and the wound was healed. On examination 10 days after operation the expansion of both sides of the chest was equal. A faint friction rub could be heard over the fifth interspace to the left of the sternum. No differences from the normal could be detected on either side of the chest. Examination 14 days after operation showed both heart and lung sounds to be clear.



Radiogram showing position of bullet.

Interesting points in this case are:—1. The narrow escape of the patient from a fatal injury when wounded. Presumably the fibrous pericardium was sufficient to stop the career of a spent bullet. 2. The radiographic examination. The cardiac movements transmitted to the bullet as well as the respiratory movements showed that the bullet was in intimate relationship to the pericardium. It was difficult to say on which side of the pericardium the bullet lay. The radiograph rather suggested the cardiac side. 3. The comparative freedom with which heart and pericardium could be examined without embarrassment under an inhalation anæsthetic. 4. The possibility of separating the pleura off the pericardium without any recognisable collapse of the lung taking place. The pleura blew out into the wound with each inspiration.

I am indebted to my house surgeon, Miss Miall Smith, for her good assistance and care of the case, and to Dr. J. Morison for the invaluable aid of the X rays.

Harley-street, W.

"INCREDIBLE MEANNESS."—At the last meeting of the Barnstaple (Devon) rural council a letter was read from a medical man in reference to the reduction of notification fees from 2*s.* 6*d.* to 1*s.* The writer stated that after allowing for the cost of sending "swabs" for bacteriological examination only 4½*d.* remained to the medical attendant for his time and trouble, and he added that if the council refused to pay the postage the writer would not send any more. The letter was written "as a protest against the incredible meanness" of the Local Government Emergency Legislation Act.

# CESSATION OF TACHYCARDIA ON THE OUTBREAK OF SPONTANEOUS PERSPIRATION.

BY SIR THOMAS OLIVER, M.D. GLASG., F.R.C.P. LOND.,
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RECENTLY I saw in consultation with Dr. S. D. Metcalfe, of Benwell, Newcastle-upon-Tyne, a man of sedentary employment, aged 28 years, the subject of tachycardia, who had rapidly become cyanosed and who was dangerously ill. The patient, a well-built man and married, had three days previously, when at work, been seized unexpectedly with vomiting, and immediately afterwards tachycardia developed. The vomiting kept recurring, and was rather a distressing symptom. This was not the first occasion on which the patient had suffered from such a seizure. Eight years ago, just before his marriage, he had an attack; three years ago he was similarly held, and since then he has had minor seizures, but with the exception of the original attack, to be subsequently mentioned, in none of them had he been so severely held as in this last. Until his recovery from this last attack no explanation of the seizures was forthcoming. It now appears that at the age of 15 after running a few miles, during which he stumbled twice from exhaustion, his heart began to beat violently and the beats were quickened. For two days after running he lay in bed unconscious. The patient is extremely abstemious and is only a light smoker. There is no rheumatic history, nor is there any abnormal physical condition of the body ascertainable through which the attack could be regarded as having developed reflexly.

When I saw patient he was lying in bed, calm and composed. There was no indication of nervous excitement, and, considering the rate at which the heart was beating, there was an absence of respiratory distress. The face was pale, and although the lips were cyanosed the blueness was less than it had been two to three hours previously. The pulse was extremely rapid, about 200 per minute; not all the pulsations reached the wrist. On examining the heart the apex beat was felt fully one inch external to the nipple line and slightly higher up than usual. At and internal to the apex beat a loud, blowing, systolic murmur could be heard, but no second sound, while external to the nipple line, in addition to the systolic murmur, a faint but normal second sound could be heard. The systolic murmur was audible over the lower part of the sternum, also over the base of the heart, where it was followed by a feeble second sound. Over the præcordium generally all that could be heard was an almost constant blowing, systolic murmur. The area of cardiac dullness was increased transversely. The lungs were normal. There were marked epigastric pulsation and an enlarged liver. The urine was normal. There was neither œdema nor rise of temperature. A moderate amount of sleep and physical quietude had been secured by the hypodermic administration of morphia, strychnine, and digitalin. As vomiting still continued an effervescing soda, bismuth, bromide, and belladonna mixture was ordered, and this gave relief.

Dr. Metcalfe, who had examined the patient shortly before the attack, was able to assure me that the heart was at that time normal and that the apex beat was then inside the nipple line. Within three days, therefore, this man's heart had rapidly dilated; the left ventricle had expanded as shown by the situation of the apex beat, and the right had dilated as indicated by the epigastric pulsation, while the widely distributed systolic murmur was additional evidence of an increasing enfeeblement of the myocardium generally.

The patient's condition was sufficient to cause anxiety on account of the recurrent vomiting and the supervention of cyanosis upon pallor. Later on, during the evening of my visit, perspiration broke forth. Shortly after this the patient sat up in bed, and said now that he had begun to sweat he knew from past experience he would soon be better. His expectations were confirmed, but not until another experience of previous attacks had become realised in the advent of pain located over the manubrium sterni and base of the heart, attended by a sense of great difficulty of breathing as the beat of the heart slackened and the pulse-rate fell. Having this presage of recovery the patient had on the whole a comfortable night.

Next morning the pulse had fallen to 74, epigastric pulsation had disappeared, the systolic murmur was inaudible, and the apex beat had slightly receded. The rapid decline of the tachycardia and disappearance of the physical signs of cardiac dilatation upon the outbreak of spontaneous perspiration are the main features in the case. It is not unusual for tachycardia to suddenly cease. This has been known to occur, for example, after the emission of a large quantity of urine.

We searched for an exciting cause of the attack of tachycardia in our patient, but without success. The illness came with a vomiting, and it disappeared with a perspiration; for two days the perspiration continued. The thyroid gland was normal, so that the influence of an internal secretion from this gland can be ignored. The view we took at the time was that the attack was one of central origin and due either to loss of vagal control or to increased discharge from the accelerator nerve centres. There was nothing to indicate that the attack was consequent upon any primary derangement of cardiac ganglia, for although several of the pulse beats failed to reach the wrist this circumstance did not seem to point to extra-auricular systoles so much as to failure of the driving power of the left ventricle. The bundle of His when it has undergone fibrosis is said to cause tachycardia; so, too, does arterio-sclerosis of the cardiac coronary arteries, but the rapidity with which the symptoms and physical signs disappeared, also the outbreak of spontaneous perspiration, point to functional derangement of the central nervous system. I have seen tachycardia cause death through myocardial and general exhaustion. In our patient there was never any of the sense of dread or distress which are sometimes observed in angina pectoris.

Newcastle-upon-Tyne.

# Medical Societies.

## ROYAL SOCIETY OF MEDICINE.

### SECTION OF SURGERY.

*Treatment of Convalescent Soldiers by Physical Means.*

A MEETING of this section was held on July 21st, Sir RICKMAN GODLEE, K.C.V.O., being in the chair.

Sir RICKMAN GODLEE announced that Sir Alfred Keogh, Director-General, had written expressing his regret that he could not be present, as he had hoped, and stating that General M. W. Russell was representing him at the meeting. Sir Rickman Godlee extended the welcome of the society to the staffs of the medical services of the four colonial contingents, and invited them and any other visitors to take part in the discussion should they so desire.

Major TAIT MCKENZIE, R.A.M.C., read a paper on the Treatment of Convalescent Soldiers by Physical Means. He said the military general hospital was very much like a general post-office in one respect, for in the latter the material was sorted out into first-class, second-class, and third-class matter. The first-class matter in these hospitals was distributed to various hospitals for operation or other treatment, and usually found its way back into the firing line within a month or so of the commencement of the disability. It was usual for the second-class matter to stay a little longer in a convalescent hospital, but most of these patients were back at the front in the course of six or eight weeks. But there remained the third-class matter, which was not brought back by these two processes. At the beginning of the war this material accumulated in various depôts and became an increasing encumbrance to the military authorities. It was to provide for this class of case, which could not be brought back in a few days or weeks or within six months, that the "Command Depôt" was established. His own experience was obtained at the Heaton Park Depôt. In the first year of the war so many urgent matters required attention that the Director-General was unable to provide for the situation until the Command Depôt was established for the reception of the more prolonged cases. This convalescent hospital was under the Royal Army Medical Corps, and a limit of six months was placed on the time necessary to treat the

cases. The prime object of the Command Depôt was to return the patients to active service. If that could not be done, the next best thing was to get them fit to serve on lines of communication abroad. Failing even that, they aimed at getting the men into some sedentary work which was useful to the Army at home. If none of these purposes could be accomplished in the case of any patients, then the object was to remove them from the Army as soon as possible. The sources from which the men in the Command Depôts came were various, and included convalescent hospitals and the depôts of various regiments, and the kind of case varied with the source. There were a very large number of nerve cases; men suffering from various forms of shock, cases which were tremulous, which stammered, which had either diminished or increased sensitiveness; those who suffered from breathlessness and from rapid and dilated hearts owing to over-exertion. There were also many cases of supposed rheumatism and of real rheumatism, cases suffering from the after-effects of gas (bronchitis and asthma), and patients with debility following the serious dysentery which was prevalent at Gallipoli, enteric, and malaria. In the depôt to which he was attached there was also a constant stream of wounded, men who had been shot in every conceivable part of the body, and those suffering from contractures, stiff joints, and very painful scars. There were usually 2000 or 4000 cases in each depôt, and the treatment carried out was largely that which came under the heading of physical therapy. This included electricity, hydrotherapy, radiant heat, massage, passive exercise, mechano-therapy, and progressive physical training. It did not follow that because a case was having massage it should also have passive movement or active exercises. If the scar-tissue were not properly organised these movements were liable to break it down again, the inflammatory process might be renewed, and the last state of such a patient would be worse than the first. The electrical equipment consisted of the three forms of current usually supplied by the polystat. The faradic was mostly used in the diagnosis of nerve injury, for the treatment of functional heart trouble, and to stimulate wasted muscles. By the employment of the condenser the current was rhythmically interrupted and its intensity varied, and in cases which did not permit of movements being carried out it formed a good substitute for them. Arm and leg baths through which the galvanic current was passed were found useful for weakened limbs, for some cases of frost-bite, general conditions of impaired circulation, and for the softening of scar-tissue by ionising with sodium chloride and iodide of potassium. The less irritating sinusoidal current was of value in maintaining nutrition of muscles whose nerve-supply was defective. The electrodes used were copper-wire mesh, adjusted to fit the thigh, leg, or other special region, the electrode being covered with felt. Naturally, when dealing with such large numbers of men, the prescriptions were carried out, more or less, in classes, and every care was taken to supervise their operation, otherwise the effort was wasted. With the help of the Committee on Balneology of the Royal Society of Medicine the ordinary hut had been converted into an ideal hydrotherapy establishment. The hot or cold stimulating douche had been useful not only in treatment but also in diagnosis of the real nature of cases of supposed rheumatism. The serious cases of rheumatism were treated in the sub-thermal tub bath, the 20 minutes' immersion in this at a temperature of 94° F. being followed by general massage. The large pool bath, capable of immersing up to their necks 12 men at a time, was kept at a temperature of 94°. The stay was one hour on each occasion. Cases of shock and disordered heart were given this bath as a routine measure. For patients with painful scars or frost-bitten feet, a whirlpool bath, in which the water was kept violently agitated, was given at a temperature of 110°. For painful limbs the urging of compressed air into the stream provided a comforting effervescent envelope. Twenty minutes of this produced a flushing with blood, the circulation remained enhanced for hours, and the patients experienced a definite sense of relief. It also constituted an excellent preparatory course for massage and manipulation. When it was not desirable for the scar to be softened dry heat was applied by means of radiant-light baths. The Almeric-Paget Massage Corps had supplied trained masseuses and each operator could treat 20 cases daily. Recently the massage staff had been strengthened by the addition of the first graduates from St. Dunstan's who had been blinded in action. Only those who had been carefully trained should be allowed to carry out this important work. As massage progressed it was supplemented by passive manipulation. The necessary re-education of affected muscles and joints was, to a large extent, accomplished by arranging tasks of progressive difficulty. At his depôt specially designed weight-and-pulley machines were in use for this purpose. Later free gymnastics threw the patient more on his own resources. Men at this stage were joined by those suffering from shell-shock, those able to do only very light exercises, and debilitated convalescents from enteric or dysentery. These progressed together to the stage, if possible, of full physical training. Not more than 30 per cent. of the cases of disordered heart's action could be brought back to class A, as arduous work brought about a relapse in most of them. And the bronchitis which had been started by exposure to gas was frequently reawakened by a forced effort to run and jump. The orthopædic, the puzzling nerve conditions, and other obscure cases could now be referred to the established special hospitals. The results obtained in the Command Depôts fully justified their establishment. At Heaton Park, half the patients had been rendered again fit for active service and had rejoined their units in the fighting line; 12 per cent. had been sent to the lines of communication abroad, 12 per cent. to useful sedentary work at home, while the remaining 28 per cent. had been discharged as "permanently unfit." The eight Command Depôts had, since their establishment, returned a full Army division to the fighting line. The average time these men were under treatment had been less than three months, and many of the cases which could not be restored to category "A" yet had their opportunities for a useful career in civil life greatly increased by the treatment. Major McKenzie finally expressed his indebtedness for help rendered to him by his assistants.

Lieutenant-Colonel R. J. MORRIS (of the Command Depôt, Ripon, and of Harrogate) pointed out that Professor Ling, more than a century ago, coördinated and elaborated physical exercises as a definite treatment of suitable conditions. These remedial exercises were divisible into active, passive, and duplicated. In the last of these the work was partially done by the patient, another person providing the resistance. In his experience at Ripon the physical means had proved to be the most efficacious. Since November, 1915, over 76 per cent. of the men in his depôt had been returned to service. The physical means used there were massage, remedial gymnastics without apparatus (conducted by experienced masseurs and masseuses), exercises with apparatus (such as fixed bicycle exercises, rowing machines, grip dumb-bells, graduated weights), and stimulation of nerves and muscles by galvanic and faradic currents rhythmically interrupted and reversed, on the Bergonié system. This latter was particularly useful on account of the trophic effect of impulses passing through the motor nerves. When the patients were able to endure more strenuous exercises members of the Army gymnastic staff from Aldershot took them in hand, under the supervision of a commissioned officer in that service. Owing to the mental condition of the patients, due to their experiences, the work called for much patience. Many cases were sent much too late. He considered that Command Depôts were excellent institutions, and even better results would be obtained by them when they were more generally known among the authorities who were responsible for sending the cases.

Dr. W. BEZLY THORNE recommended mineralised baths for irritable heart and rheumatism. He had had cases of trench rheumatism scarcely able to move after treatment by radiant heat, massage, and the internal administration of salicylates who yet were placed entirely on their feet by means of mineralised baths and exercises, especially if instead of drying the patient after taking the bath he were allowed to dry gradually in his blanket. He gave some instances of successful results thus obtained. In cases of irritable heart and muscular tremors care should be taken to avoid long immersions.

Dr. R. FORTESCUE FOX thought the reports of the work by Colonel Morris and Major McKenzie most opportune, and the whirlpool baths were a new feature, so that nothing very dogmatic could yet be said about them; but there was every reason to consider that at high temperatures and for long periods they materially assisted the moving of

immobilised limbs. He emphasised the importance of actively insisting on mensuration in these cases periodically from the commencement, as it would greatly aid a satisfactory solution of this difficult question. The Balneological Committee of the Society considered it very advisable to have, in all places where physical means were employed for wounded soldiers, a uniform system of record, so that the opportunities for study and the advance of medical knowledge furnished by the war should not be neglected.

Colonel RODD (Canadian Hospital, Ramsgate) said that at his depôt at Ramsgate practically the same classes of cases were seen as Major McKenzie had described, though mostly at a rather earlier stage. As in all other departments of medicine, the important matter was the diagnosis, and at Ramsgate a special medical board paid particular attention to this. In six weeks quite a considerable number of myopathic and neurasthenic cases were found to have tertiary syphilis, and the recognition of this and the immediate application of appropriate treatment soon resulted in those men being back in the firing line. The apparatus used at the depôt had been constructed very cheaply, and was quite efficient for the purpose. He described the method of graduation towards fitness which was carried out, ending with instructors who took the men on route marches and others who had charge of them on the playgrounds, the men being required to spend two hours per day at play of some kind. They could not work at the light duties allotted to them more than four hours per diem, and they must not work less than two hours. This limitation was necessary, as some of the more eager were willing to put in eight hours daily. A series of periodic checks by medical officers were carried out to ensure that patients, while not being overtaxed, were making the best possible progress towards recovery.

Dr. E. P. CUMBERBATCH thought the subject of the treatment of injuries and wounds inflicted in war had received only small attention in Major McKenzie's address, for he made no mention of treatment by those most important electrical methods diathermy and the high-frequency current. He wished briefly to refer to what Major McKenzie spoke of as "third-class material"—i.e., cases of paralysis of muscles and nerves which would be left after the war had concluded. These could be appropriately called fourth-class material. In the electrical department at St. Bartholomew's Hospital he was seeing cases which had been discharged from the Army and were attending for further treatment of paralyses due to nerve injuries received earlier in the war. Cases which had had injuries to nerve trunks would, even under the best treatment, require attention for 18 months or longer before the return of some degree of power, and he considered that the best treatment of such cases was by baths supplied with the rhythmically varying sinusoidal current. In his department at the hospital a series of such baths had been in operation for nine years, and the results in the treatment of cases of paralysis following nerve injuries and diseases of nerves were uniformly good.

Major W. J. TURRELL (Oxford) said it had been most interesting to him to hear Major McKenzie's paper, as it treated the subject from the general standpoint of physical therapy, which included many subsections that often were not correlated. The present contribution scarcely exhausted the possibilities of modern electro-therapy. A most important method of treatment was by diathermy. When a continuous current was interrupted muscular contractions ensued but when their frequency exceeded 500 per second no visible contraction occurred and the patient was not conscious of any sensation. From the ordinary high-frequency current benefit had been derived for a great many years. The whirlpool bath and various forms of hot bath affected the surface of the body or limb only, whereas in diathermy the current proceeded direct through the tissues intervening between the two electrodes, and the beneficial current could be brought to bear on any part of the system That was surely a great advance, and it had been very efficacious for frost-bite and for the relief of acute pain. It was perfectly safe to use and it suitably warmed up tissues as a preliminary to massage. He quoted figures from his technical department at Radcliffe Infirmary, Oxford, and proceeded to point out the advantages, in certain cases, of the static machine, the violent contractions so produced constituting an efficient auto-massage of the muscles; it also cleared up joint effusions and phlebitis and liberated fibrous adhesions. The Bergonié system was also useful for the same kind of case. These further developments of electrical methods were well worthy of consideration in the treatment of wounded soldiers.

Dr. W. GORDON (Exeter) said the Command Depôts had been long hoped for. There were a deplorable number of cases which had been transferred from one place to another until the stage at which most good could have been accomplished had passed. He had great faith in treatment of some forms of injury by means of hot sand; some cases derived more benefit from that than from the application of radiant light or heat. With regard to the use of mineralised water for remedial baths he was told at a large establishment in the north of Paris that it was of no consequence whether the water was sulphurated or not. He agreed as to the benefits of employing a proper periodic system of mensuration. It assisted in accurate diagnosis, ensured that the best treatment was being applied at each stage, and enabled one to confidently apply the right method to each class of case owing to the results already obtained in similar ones. He did not favour too great an economy in the setting up of the necessary apparatus.

Dr. R. ACKERLEY (Llandrindod Wells) said he had been treating cases of injury and nervous disease by physical means for more than 20 years, and in his view the great object to aim at was to overcome defects of circulation by producing active congestion in the affected part. If the patient was to be spared pain one must begin with passive movements; active movements should not be the first stage. The presence of pain was sometimes the only obstacle to movement, and this pain must be removed in the best way. Some cases were successfully treated up to the point of taking short walks, and he suggested that such cases should be sent to places where they could have Swedish exercises and then be trained to march with their full pack.

Major MCKENZIE briefly replied. He said that they had not facilities in the Command Depôts for mineralising the baths; reliance was placed on the temperature. The benefits obtainable from the high-frequency current were still so much a matter of dispute that it was questionable whether it was justifiable to instal an expensive apparatus for that form. The Bergonié system was in full operation at Ripon under Lieutenant-Colonel Morris.

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## SECTION OF DERMATOLOGY.

*Exhibition of Cases.*

A MEETING of this section was held on July 20th, Dr. J. H. STOWERS, the President, being in the chair, when the following cases were shown:—

Dr. E. G. GRAHAM LITTLE: 1. Xanthoma Tuberosum. Lesions commenced on the right elbow two years ago, since when they have appeared on the left elbow, knees, and in the sacral region. The urine was natural; nothing else abnormal was discovered, and no other member of the family was affected. 2. Acne Urticata of Kaposi. The lesions appeared as diminutive papules resembling millet seeds in the skin. The itching was intense, which made the patient scratch and pick the seed-like bodies out. Excoriations and bullæ resulted. When certain lesions had healed others reappeared in the same situation. The extremities and not the face were involved.—Most of the members thought the case was either one of lichen planus with bullous lesions or dermatitis herpetiformis.——3. Urticaria Pigmentosa in a male aged 34. The patient had had the condition for 17 years.

The PRESIDENT: Lupus Vulgaris in a female aged 19. The initial lesion was a small ulcer in the mouth which first appeared in 1912. Since then lupus nodules had appeared on the skin around the mouth, other ulcers in the mouth, and tuberculous adenitis in the neck had also supervened. The right cheek was now much swollen owing to the presence of a dense infiltrated mass of tuberculous tissue. Although most of the recognised forms of treatment, including X rays and Finsen light, had been frequently applied, the patient's present condition had not materially improved.

Dr. G. PERNET: Dermatitis Herpetiformis in a small boy aged 5. The patient had had several recurrences since the disease first started two years ago. The trunk, front and back, was involved, but there was no pruritus.

Dr. W. KNOWSLEY SIBLEY: 1. Urticaria Pigmentosa in a man aged 19. The duration was only two months, and

the patient did not complain of itching. 2. Nævus with Ulceration. The patient was a man, aged about 20, with a congenital nævus and partial gigantism of the region of the right knee-joint. In connexion with the nævus were patches of ulceration and pigmentation.—Dr. F. PARKES WEBER considered the case to be one of multiple pigmentary sarcoma of Kaposi.——3. Case for diagnosis. Patient had had for 12 years on hands, knees, and ankles lesions closely resembling lichen planus. There were other lesions which were raised, hard, and not unlike warts.—Dr. H. G. ADAMSON pointed out that similar cases had been described in America under the name of lichen obtusus corneus.

## MEDICO-PSYCHOLOGICAL ASSOCIATION OF GREAT BRITAIN AND IRELAND.

*Mental Disabilities for War Service.*

THE seventy-fifth annual meeting of this Association was held at the rooms of the Medical Society, Chandos-street, London, W., on July 27th, Lieutenant-Colonel DAVID G. THOMSON, the President, being in the chair

Sir GEORGE SAVAGE read a paper entitled, "Mental Disabilities for War Service." He said that though he did not wish in any way to protect shirkers, he wanted to avoid sending into the Army men who were almost certain to break down under training, or when they arrived at the front. He had met many doctors who acted on the idea of giving the men a chance. He granted that sometimes a complete change in mode of life might convert a hypochondriac into a useful worker, but in taking a risk one must see on whom the risk fell. He saw at one hospital numbers of men who ought never to have been accepted, men who involved much trouble and anxiety, as well as cost to the nation. He had been consulted by many former patients and their relatives as to their fitness for military service. When men had had at least one attack of insanity hereditary predisposition must influence judgment of the case. It was his practice to oppose the enlistment for active service of any young man with a direct insane inheritance who had had one marked attack of mental disorder within a few years of this date, if such disorder had needed detention. Some of these men were quite suitable for home or munition work. In these cases the previous breakdown was usually unknown to the man's employers or associates, who therefore dubbed him a shirker or a coward. He had seen several people who were becoming unstable because they had been made keenly to feel the mistrust of other people; in some it seemed a lesser danger to allow them to enlist on account of the fear, otherwise, of their developing delusions. In some the struggle to decide as to what was their duty had led to various forms of functional mental disorder. One case formerly seen for adolescent mental weakness, with inability to concentrate in training for a profession, experienced a return of the old symptoms when the question of enlistment arose. There had also been a recurrence of symptoms of mental disorder in so-called shock cases, and his opinion was that none of these cases should be allowed to return to duty under six months. A class of case which he usually allowed to run the risk of enlisting was that in which the young man had shown, earlier in life, a great weakness for lying and pilfering, for which no treatment seemed to do good. It was possible such men might make good fighters. It was interesting to recognise a form of functional epilepsy which might follow shock or injury. He had seen men, who, as the result of psychic strain or shock, lost consciousness for short periods, and though when removed from the strain they recovered, yet they relapsed when sent back to duty. He was confirmed in his opposition to the enlistment of inveterate somnambulists. His experience had included some peculiar cases of obsession. One case was that of a manufacturer who since a railway accident in which he happened to be had never travelled in a train and had a dread of doing so. His mother was in an asylum, and the speaker opposed his enlistment. A large and important class was the syphilitic, including the general paralytic, the ataxic, and some para-syphilitic cases. Very many cases of early general paralysis had occurred in the Army, and the anxious life was well calculated to start the more active symptoms. No man with a clear history of nerve degenerative symptoms related to syphilis should be allowed to enter the Army, but in some of the cases the symptoms were recent, and these, after suitable treatment, might be allowed to enter the service.

Dr. PERCY SMITH said that he had met with a number of cases similar to those spoken of by Sir George Savage. Patients with whom he had come into contact, perhaps years before, had come recently to learn the right course for them to follow. In some worry about the war and the new requirements had brought a return of their former symptoms, and in most of them he did not hesitate to say the men ought to be exempted. Medical officers of the Army who did not know the history of the man, and might not have had any special knowledge of mental disorder, did not recognise that men who looked physically fit might yet be very unfit for the Army, because they would soon break down under its ritual. Certainly no case of epilepsy ought to be allowed to enter the Army. Some had got in, and had been made much worse. He detailed several cases in his own experience. One man, aged 45, who had always been neurotic, joined the Anti-Aircraft Company, and was put on to search-light duty, with the result that he had acute insomnia, great depression, and a suicidal tendency. A young man, aged 23, whose father was insane, was given a commission, and only a week afterwards he broke down and attempted suicide. Yet he had been refused permission to declare sick. His depression was followed by acute delirium. Some cases had suffered severe strain by the feeling that they were not doing their share, yet they were mainly manifestly unfit.

Dr. G. E. SHUTTLEWORTH said that during the course of the war he had seen some men who were originally feeble-minded boys, and were now brought to him with the view of being certified as unfit for military service. He did not so certify them straight away on that mere fact, because in the South African War some reputedly feeble-minded boys made, when they grew up, very good soldiers. He was acquainted with the figures for the special schools in London and Birmingham, and in 1915 it was reported that 70 had joined from the London schools and 100 from Birmingham. There was something to be said in favour of institutional children, because they had had a good deal of drill and were prompt in carrying out commands; moreover, the Army discipline was likely to do much to keep them straight, if they had sufficient nerve force to stand the incidental shocks and strains. Careful judgment was required in regard to the anxious patients in better social positions. He had had one or two cases of moral imbecility. These were interesting, but very difficult to group. One boy developed, at puberty, a great leaning to lying and stealing, though he had been very straightly brought up. He enlisted, and in Flanders was constantly in trouble. Dr. Shuttleworth said that he wrote to the officer, giving a history of the boy, and the result was that he was discharged. He had had his measure of punishments, but there was no benefit.

Dr. SEYMOUR TUKE said it had probably fallen to the lot of most of the members to be called upon to certify as to the fitness or otherwise from the mental point of view of men to join the Army. He recently had had much trouble with a family which had an extraordinary history on the mental side, and as the member of it who came to him about an exemption certificate had suffered much from insomnia and quite lost himself when he was worried, he did not hesitate to certify him as unfit for the Army, though he was able to follow a quiet occupation for his living. Those who had a pronounced neurotic history should be treated with suspicion. One such man was in the South African War, and on his return he developed such a ready speech that he was put on to recruiting. During this work he became increasingly excited and was now the subject of subacute mania. There was an old history of tubercle, otherwise he was a strong man.

The PRESIDENT considered the subject an interesting and difficult one, and one on which it was not easy to lay down definite principles. Those in charge of war hospitals saw the results of admitting persons to the Army who had suffered mentally, or who at least were potential lunatics. Yet when asylums had to be vacated in order to make room for war cases there was difficulty in finding room for all the insane patients, and where there was any doubt the patients were set at liberty. Some of these joined the Army, and a number had written asking how their old friends in the asylum were now.

# Reviews and Notices of Books.

## *The Diseases of Women.*

By Sir JOHN BLAND-SUTTON, F.R.C.S.Eng., LL.D., Surgeon to the Middlesex Hospital; and ARTHUR E. GILES, M.D., B.Sc. Lond., F.R.C.S. Edin., Senior Surgeon to the Chelsea Hospital for Women, and Gynæcologist to the Tottenham Hospital. Seventh edition. With 150 illustrations. London: William Heinemann. 1916. Pp. 571. Price 15*s.* net.

IN the seventh edition of this manual the text has been thoroughly revised and the subject matter rearranged. The authors have departed from the anatomical system of classifying diseases and have adopted a pathological system. As they point out in dealing with malformations, displacements, and infections which are liable to affect several portions or the whole of the pelvic organs, it is evident that the anatomical classification must lead to confusion, whereas the pathological classification enables the student to obtain a much clearer view of the sequence of the lesions involved. The result of this change is to give the book many new features and undoubtedly to increase its value. The general size and form of the book have also been altered for the better. The diagnosis of the various pelvic affections, their treatment, both medicinal and operative, and their prognosis, are all considered in separate sections; this saves a good deal of repetition and should prove useful to the student. The statistics given of the results of abdominal operations on the female pelvic organs at the Chelsea Hospital for Women are very interesting, comprising as they do 3483 cases with 71 deaths, or an average mortality of only 2·03 per cent.

The section on ectopic gestation is also most interesting. We notice, however, that the authors still consider that the blood in a tubal mole lies between the chorion and the amnion rather than in the chorio-decidual space, and in their series the frequency of cases of tubal moles to tubal rupture is in the proportion of 1 to 4, a figure which differs very markedly from that given by most authorities. In the section on fibrosis uteri no mention is made of the important work of Briggs and Hendry, which seems to show that it is extremely doubtful if there is any causal relationship at all between this condition and severe uterine hæmorrhage. The only treatment suggested is hysterectomy, and the good results which have followed the intra-uterine application of radium are entirely ignored. The description given of the extended abdominal hysterectomy, generally known as Wertheim's operation, is not full enough and would be of little assistance to anyone practising this operation for the first time. We are told that the operative mortality is very high and that no reliable returns concerning the remote results are at present available. But the authors can hardly be unacquainted with the very full and careful results published by Wertheim himself, and we must therefore conclude that they consider these statistics unreliable. We doubt, however, if this opinion is held by other gynæcologists who have studied these important results. The practice of introducing two fingers into the rectum in performing the operation of perineorrhaphy, illustrated in Figs. 135 and 138, is not only quite unnecessary, but a most septic and undesirable procedure.

We have called attention to some minor blemishes in what is in general a very useful book for the student and practitioner, and one possessing marked originality. The illustrations are good and well reproduced.

## *American Sewerage Practice.*

By LEONARD METCALF and HARRISON P. HEDDY. London and New York: McGraw-Hill Book Company. Vol. I., pp. 747; Vol. II., pp. 564; Vol. III., pp. 851. Price 25*s.* each.

THE authors have divided their subject into three sections, a volume being devoted to each as follows: Vol. I., Design of Sewers; Vol. II., Construction of Sewers; and Vol. III., Disposal of Sewage. As the general title implies, the ground covered deals with American practice in this branch of engineering, but, as a matter of fact, the authors include copious references to the practices of other countries, notably England, France, and Germany. The book possesses, therefore, a more than local value, and it presents a very authoritative statement on the technique of sewage. The broad generalities of the problem are well brought out and the volumes make a comprehensive contribution to our knowledge. Apart from a historical introduction, Vols. I. and II. are concerned in a full description of the engineering aspects of the question. The first chapter in Vol. I. is very interesting reading, and amounts to a historic account of the growth of sewerage schemes, in which the authors draw attention to the lessons taught by early sewerage works. In this reference they give an account of the development of the water-carriage system at present in use in the metropolis engineered by Sir Joseph Bazalgette in 1855, soon after the cholera epidemics. Paris also, it is interesting to recall, inaugurated a sewerage system after a severe cholera epidemic in 1832. Many advances have since been made in the ultimate treatment and disposal of sewage, and this is the subject of Vol. III. Here we find the chemical and biological methods of purification adequately described, and we know of no more thorough survey of the subject in the light of recent developments. These three volumes will be a very valuable source of reference to engineers, chemists, and all students anxious to be familiar with the world's methods of engineering, treating, and purifying sewage.

## LIBRARY TABLE.

*The Essentials of Histology (Descriptive and Practical) for the Use of Students.* By Sir EDWARD A. SCHÄFER, M.D., Sc.D., LL.D., F.R.S., Professor of Physiology in the University of Edinburgh. Tenth edition. London: Longmans, Green, and Co. 1916. Pp. 563. Price 10*s.* 6*d.* net.—The tenth has followed the ninth edition of this useful manual within little more than two years, in spite of the increasing dearth of medical students. The text has been revised without any notable alterations, and many illustrations have been added, the majority being photographs of microscopic preparations. The endocrine glands, as we should expect from the author, have been specially generously treated. We repeat again here the complaint that not all the sections have a note of the scale of magnification. The addition of this to each illustration and of the method of staining adopted would materially add to the value of the book without increasing its size. The present-day student is fortunate to possess such a manual as this, complete in essentials and attractive in form.

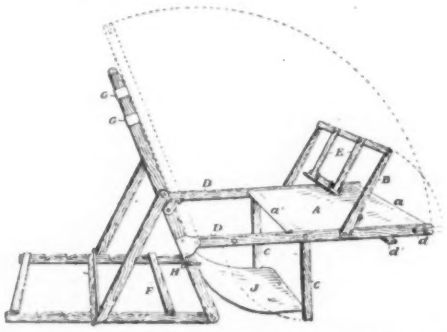
*Measures for Avoidance and Extermination of Flies, Mosquitoes, Lice, and other Vermin.* By H. MAXWELL-LEFROY, M.A., F.Z.S., Professor of Entomology, Imperial College of Science and Technology; late Imperial Entomologist to the Government of India. Calcutta and Simla: Thacker, Spink, and Co.; London: W. Thacker and Co. 1916. Pp. 17. Price 1*s.* net.—A second edition of Professor Lefroy's useful pamphlet is welcome. It contains simple instructions for avoiding the attack of disease-carrying insects and for their extermination. The pamphlet was written in response to inquiries from doctors, nurses, and others as to how to protect themselves and those under their charge. The first edition was circulated privately last summer and enjoyed great popularity. The present edition has been brought up to date with the help of the entomologists who have been working at the front and of investigations carried on during the winter at the Imperial College. Matter specially applicable to India has been added. The simple directions and modest price bring the pamphlet within the reach of all.

*The Maintenance of Health in the Tropics.* By W. J. SIMPSON, C.M.G., M.D Aberd., F.R.C.P. Lond., Professor of Hygiene and Public Health in the University of London. Second edition. London: John Bale, Sons, and Danielsson, Limited. 1916. Pp 174. Price 3*s.* 6*d.* net—This little handbook on the maintenance of health in the tropics was written more than ten years ago at the request of the Committee of the London School of Tropical Medicine, and describes in a simple and popular manner the measures of personal hygiene desirable for visitors or residents in the tropics. That Professor Simpson has gained his object is evidenced by the call for a second edition. The book has been brought up to date and the chapter on snakes revised by Colonel Alcock. No one should live in hot countries without taking to heart the lessons inculcated in this little book.

# New Inventions.

## AN IMPROVED BED-REST.

THIS improved form of bed-rest, combined with table and book-rest, which has already proved a great boon to wounded soldiers, has been brought to our notice by Mr. H. W. Husbands, M.R.C.S. Eng., L.R.C.P. Lond. As will be seen from the illustration, the apparatus is of the folding type, and is very light to handle, weighing 8 or 9 lb. The book-rest *E* can be folded up and locked down on catch *d* when a table

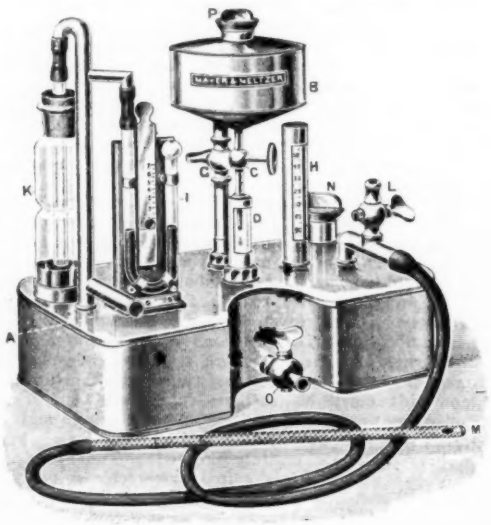


only is required, and a detached wooden table can be substituted for the canvas roller-table if necessary. The whole of the table and book-rest part of the apparatus can be folded out of the way when a bed-rest only is required. The advantages claimed for this bed-rest are: Firstly, there is no objectionable bottom crossbar at the lower end of the back, the only crossbar *F* being kept well behind, the patient being supported by the canvas back and cross webbing. Secondly, the extension of the canvas back *J* under the patient makes a comfortable support for his back; should the patient be unable to raise himself to enable this extension piece to be passed under him, it can be turned back and buttoned securely out of the way. Thirdly, the canvas of the back and of the table can be easily removed for washing.

The apparatus can be obtained from Mr. R. Brooks-King, Widecombe, Taunton, the price for the bed-rest alone being 9*s.*; bed-rest and table, 13*s.* 6*d.*; and bed-rest, table, and book-rest, 15*s.* 6*d.*

## A NEW APPARATUS FOR THE INTRATRACHEAL INSUFFLATION OF ETHER.

IT has been frequently urged that the outfit required for this valuable method of anæsthesia is too cumbersome and unnecessarily expensive, and it has long been my feeling that both these objections ought to be overcome. The apparatus described here is a further attempt (*vide* THE LANCET, July 11th, 1914) to meet this criticism; the design was roughly sketched and placed before Messrs. Mayer and Meltzer in 1914, but for various reasons execution was deferred until last year, and the finished model was shown before the Section of Anæsthetics of the Royal Society of Medicine on April 14th last. The idea underlying the apparatus is that ether drips from a container (B) into a central chamber, through which passes the air current (A) from the motor or foot bellows, and is there vapourised, partly by this means and partly by the heat imparted by an encircling hot-water jacket. The tap C regulates the flow of ether, which can be delivered in drops or in a continuous stream. The tube G, connecting the ether container and the vapourising chamber, equalises the pressure on the upper and lower surfaces of the ether, and regular dropping is ensured. During anæsthesia the tap of the equalising tube must be kept open, but if the container needs refilling during an administration this tap must be first closed before the bung of filling funnel (P) is removed, and kept closed until P has been replaced. At the end of anæsthesia the container can be emptied by means of a tap (not shown). K is the safety valve I the manometer, and L the tap on the exit tube for reducing pressure. The hot-water jacket is filled at N, and emptied by opening O. The thermometer, H, should register 110° to 120° F., according to the temperature of the room and the nature of the operation. A Y-piece provided with a tap is fixed in the tubing from the motor for attachment to an oxygen cylinder.



The hot-water jacket stands in a non-conducting cover. The apparatus is simple and compact; it weighs 5½ lb. and measures 8½ × 4½ × 12 inches. The arrangement of the motor and foot bellows is practically the same as that previously described (*vide supra*).

Messrs. Mayer and Meltzer, Great Portland-street, W., have made the apparatus with their usual care and skill.

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SPHAGNUM MOSS DRESSINGS IN IRELAND.—A Dublin correspondent writes:—"When the Irish War Hospitals Supply Depôt started its work in November, 1915, at 40, Merrion-square, Dublin, the entire control of sphagnum moss was handed over to the Royal College of Science Detachment of the St. John Ambulance Brigade, which has since organised 25 sub-depôts throughout Ireland with the help of advice from Colonel Cathcart. Some difficulty was at first experienced in getting the proper moss, but after sending correct samples to collectors an excellent supply was obtained, the quality of that coming from Galway, Mayo, and the King's County being particularly good. A committee of the Royal College of Science Women's Division manages the depôt, for which excellent work-rooms have been granted by the Department of Agriculture. During the last seven months sphagnum dressings have been turned out as follows: Simple dressings, 58,957; dysentery pads, 325; elbow and garden cushions, 1435; the latter being made from the inferior samples of moss. Eighty different hospitals have been supplied in England, Ireland, France, Belgium, Egypt, and Greece, and the requests for dressings are now so numerous that it has been found difficult to keep up with the demand. A special effort made during the past six weeks has resulted in an output of over 20,000 dressings in June and over 16,000 for the first half of July. The War Office has requisitioned 5000 sublimated dressings each month, and this branch of the work is carried out at the premises of Messrs. Fannin in Grafton-street. The history of sphagnum moss as a dressing goes back to considerable antiquity. The following incident is recorded in Joyce's 'Child's History of Ireland.' In the year 1014, when marching home after the battle of Clontarf, the Dalcassians were attacked by an old enemy, M'Gilla Patrick, a prince of Ossory. Their chief gave orders to place the wounded in safety in the rear, but they insisted on taking part in the fight. 'Let stakes from the neighbouring wood be fixed in the ground,' said they, 'and let us be tied to them for support, with swords in our hands, having our wounds bound up with moss, and let two unwounded men stand by each of us, on the right and on the left. Thus will we fight, and our companions will fight better for seeing us.' It was done so, and when the Ossorians saw this they were struck with fear and pity, and refused point-blank to fight with such resolute and desperate men."

THE LANCET.

*LONDON: SATURDAY, AUGUST 5, 1916.*

## Provision for the War Cripple.

IN spite of the marvellous development of modern artillery and small arms for their work of destruction, the vast majority of wounds which they inflict are such as to enable the bearer to return to his military duties within a longer or shorter time. In an address delivered at the Surgical Section of the Royal Society of Medicine, which we summarise in another column, Major TAIT MCKENZIE, R.A.M.C., describes the various degrees of disability and what is the plan adopted for each, with particular reference to the class of cases in which special, and in many instances prolonged, treatment is required. In order to unload the military hospitals and to group these men where the personnel and paraphernalia for special treatment are conveniently accessible, Command Depôts have now been established up and down the country, each containing 2000 or 4000 beds. Nine depôts are at present in existence—at Seaford, Shoreham, Tipperary, Ballyvonare (Buttevant), Randalstown, Ripon North, Sutton Coldfield, Kinmel Park (Rhyl), and Heaton Park (Manchester). Major MCKENZIE gives an outline of the methods employed at one of these for relieving the stiffness of muscles and of joints, after the actual injury which caused them has healed, and in general for restoring to convalescence by appropriate means any physical disability, whether due to wounds or to the diseases incidental to service. As the methods have evolved and systematised, and as experience in selection of cases has grown, results are being obtained in this country comparable to those which have been claimed for similar methods in France,[1] and a larger proportion of wounded men have returned to the front or have been retained for some less arduous form of military service.

Unfortunately, when everything possible has been done for them, there remains a certain number of luckless ones whose disability is such as to incapacitate them from further service. From our Navy and Army, numbering millions, employed in every form of service in many parts of the world, a large quota of discharges on account of permanent disablement might well be expected. It is therefore with a sense of relief that we note the actual figures quoted in a circular (No. 9) sent down by the War Pensions Statutory Committee to the Local Committees. From the beginning of the war up to May 31st, 1916, a period approaching two years, the total number of disabled sailors and soldiers discharged from all causes was 33,919. Of these, 1381 were eyesight cases, 2224 wounds of arm or leg necessitating amputation, 12,529 wounds or injuries of limbs in which the limb could be retained, 2446 wounds and injuries to the head, 2122 other wounds and injuries, leaving 13,017 invalided on account of chest complaints, heart disease, rheumatism, and other disabilities in smaller number. Similar figures are available for a year ago, and a comparison of the two returns allows a rough calculation of the monthly incidence of disability, amounting to 90 eyesight cases, 150 amputations, and 950 injuries to limbs not requiring removal. Representing, as this monthly figure must do, an appalling amount of individual suffering, whether directly as a result of wounds and disease, or from its remoter effects on a man's prospects and outlook upon life, the figure is, at all events, now known, and the problem of dealing with it one which can be squarely faced.

The task of making provision for the care of disabled officers and men after they have left the service is one of the most important functions devolving on the Local Committees of the War Pensions Statutory Committee. For those who are completely and permanently disabled for any kind of useful employment, nothing remains but the allotment of a pension sufficient to maintain a comfortable life free from anxiety. For this purpose six million pounds have been allotted by the Exchequer in the expectation that supplementary funds will be at the disposal of Local Committees. The number of men who have so far been awarded a permanent pension on the full totally disabled rate is very small. The Central Committee is alive to the undesirability of condemning men to a life of idleness if this can possibly be avoided, and the Local Committees have been asked to see in every case how far the disabled man may be encouraged to take light employment, and in the case of the partially disabled to be educated for taking his full share again in the industry of the country. For some the prospect is open of training leading to employment on an agricultural colony, but the Central Committee has laid down that, so far as practicable, disabled men should be encouraged to return to their own homes and to take their place in the ordinary industrial community under normal conditions of employment. The Board of Trade is giving consideration to the best method of guidance as to the rate of wages to be paid by the employer in any particular case. The success of the whole scheme will rest with the action of the Local Committees. Some of these are already formed and in active work, others have not yet buckled to their task. On them devolves the personal and friendly contact with the disabled man which will enable the nation's debt to him to be discharged with individual thoughtfulness and care. Nothing can completely compensate the war cripple for his disability, but it is in the power of the War Pensions Local Committees to see that his life is made as happy and as useful as his disability permits.

[1] THE LANCET, March 25th, p. 691.

## The Regulations with Respect to the Sale of Cocaine.

MINISTERIAL statements in the House of Commons had prepared the way for the announcement of some forms of restriction on the distribution of cocaine, but few people expected that the regulations would be so drastic as those which were gazetted last week, coming into force forthwith. And yet the new conditions are by no means unnecessarily strict, for there is no occasion—or we know of none—requiring the use of cocaine except under the supervision of properly qualified persons. Legislation such as that which has been enacted does not accord with preconceived views in this country with respect to provision for the use of poisons, and it is doubtful whether in peace time it would have been possible to secure the adoption of such a course as that indicated by the Order in Council; but the evils in the midst of which we live are constantly being relieved by vigorous movements towards reform. Not only is it made an offence to import cocaine except under licence, but it is now illegal for any unauthorised person to have cocaine in his possession, or for a pharmaceutical chemist to supply cocaine except on the written order of a medical practitioner. Thus by one stroke of the pen, as it were, the trivialities of the Pharmacy Acts are replaced by effective prevention of the abuse of a mischievous drug. And the Pharmaceutical Society—the body that administers the Pharmacy Acts—has been well advised in adopting the policy of coöperating with the Government in the endeavour to put a stop to a baneful traffic. It would not have been wise either in behalf of the Society or of pharmacists in general, to plead, in the one case, a vested interest in the administration of the Pharmacy Acts and, in the other, a vested interest in the sale of cocaine. The central pharmaceutical authority has placed the welfare of the State before its own, and deserves the hearty commendation of the public.

The new regulations, severe as they may appear to the ordinary observer, are less stringent than those after which they are fashioned—namely, the regulations framed under the Harrison law of the United States. In America, as has been explained in THE LANCET recently, it is not sufficient for the prescriber of cocaine to be a registered medical practitioner or for the dispenser to be a qualified pharmacist—both prescriber and dispenser must also be registered under an "anti-narcotic law." But the principle and the object of the American legislation are the same as our own; the principle in each case being the restriction of the distribution of cocaine to well-defined channels, and the object the prevention of the cocaine habit. In future the cocaine habitué will be dependent for his supplies of the drug on clandestine sources, and as it is no doubt correct to assume that special efforts will be made to prevent smuggling, we may take it that the cocaine habitué will soon be almost an extinct type in this country. The new regulations affect medical practice only as regards the writing of the prescription. A medical man who writes a prescription of which cocaine is one of the items must (1) sign it with his *full name and address and qualifications;* (2) write the date on it; (3) mark it with the words, "Not to be repeated"; and (4) specify the *total amount* of cocaine to be supplied. These requirements entail departures from the practice usually observed by prescribers, but it is important that they should do exactly as the new law requires. Strangely enough, it is not necessary in prescribing a proprietary medicine containing cocaine to state the total amount of cocaine to be supplied; it is sufficient to state the quantity of the proprietary medicine. It is not quite clear why this distinction is made. Preparations containing less than one part of cocaine in a thousand do not come under the regulations.

The pharmaceutical chemist is affected by the new conditions to the extent that he may only supply cocaine on and in accordance with a written prescription of a medical practitioner, which prescription he may only dispense once, except in pursuance of fresh directions duly endorsed on the prescription by the medical practitioner by whom it was originally issued. Registered dentists and registered veterinary surgeons are not prohibited from using cocaine in their practices, but this exemption does not extend to non-registered dental practitioners, and it is to be hoped that the Government will continue in their refusal to alter the regulations for the benefit of such unqualified persons. Anyone may be an unqualified dentist, and if we allow an unqualified dentist the right to have cocaine in his possession theoretically we allow the same privilege to everybody. The regulations as to the importation of cocaine without licence, and as to the possession of cocaine, also apply to "raw opium, powdered or granulated opium, or opium prepared for smoking" and any solid or semi-solid mixture containing opium.

## Annotations.

"Ne quid nimis."

### THE ANNUAL MEETING OF THE BRITISH MEDICAL ASSOCIATION.

THE eighty-fourth annual meeting of the British Medical Association was held in London last week, Dr. J. A. Macdonald, chairman of the Council, presiding, in the unavoidable absence of Sir Alexander Ogston. The scientific and social side was very properly dropped on account of the war. At the General Meeting Sir Clifford Allbutt was elected President of the Association for the ensuing year in succession to Sir Alexander Ogston. The gathering was reminded by one of the members that they were assembled on the eve of the fiftieth anniversary of the death of Sir Charles Hastings, the founder of the Association, and a motion was carried unanimously recording "the unabated veneration of the British Medical Association for its ever-honoured founder." The Representative Meeting had already recorded its deep regret at the untimely and patriotic death of Sir Victor Horsley, the first chairman of Representative Meetings after the reconstitution of the Association.

While the business of the General Meeting was purely formal, at the Representative Meeting,

presided over by Mr. E. B. Turner, some very important subjects were discussed. Chief among these was the position occupied by the general practitioner with reference to the State treatment of venereal diseases. Following the advice in the final report of the Royal Commission on Venereal Diseases, the State, through the Local Government Board, now proposes to organise arrangements for adequate laboratory facilities and skilled free treatment, the measures being entrusted to councils of counties and to county boroughs, while 75 per cent. of the cost of carrying out the schemes are to be met out of the Imperial Exchequer. Immediate adequate facilities for the diagnosis and treatment of venereal diseases—syphilis, gonorrhœa, and soft chancre being so defined—are to be furnished when and where they are absent or deficient. This means the establishment of clinics at hospitals, the gratuitous supply of salvarsan or its substitutes, and laboratory facilities for aid in diagnosis. The circular letter from Mr. Long, President of the Local Government Board, asking for the help of public bodies concerned, pointed out that such clinics should be available for the treatment of all comers without distinction as to means or place of residence, adding, very properly though with some discrepancy, that the treatment should be given as far as practicable in co-operation with the patient's own doctor. The position is an anxious one for the general practitioner and a serious one for the public, who will certainly not desire to see the personal medical adviser superseded by officials. On the motion of Dr. Macdonald, it was decided unanimously by the Representative Meeting that a deputation should go to the President of the Local Government Board to explain the issues involved. It is intended to secure a pledge that an Order will be issued by the Board to every local authority concerned, requiring it to have effective consultation with a representative of the local medical profession at the earliest stage of the scheme, and through all its stages.

The energies of the Association have been devoted in a great measure since the breaking out of the war to the securing of a good supply of officers for the Royal Army Medical Corps. The Central Medical War Committee has accepted with gratitude the great organising assistance of the Association, and with the aid of the public departments concerned—namely, the Local Government Board, the Board of Education, and especially the National Health Commission—it has been possible for the Committee to consider both the medical needs of the general public and the individual positions of those accepting commissions. It is well known to our readers that recently the War Office has felt compelled to modify the terms under which temporary commissions in the Royal Army Medical Corps were given, and the departure from the definite agreement that these commissions entailed one year only of service was naturally made the subject of debate at the Representative Meeting. A message from Sir Alfred Keogh, the Director-General of the Army Medical Service, was delivered to the meeting by Sir Robert Morant, defining and explaining the changes which had taken place. Sir Alfred Keogh's communication will be found on p. 253 of this issue of THE LANCET. It emerged from the discussion of the activities of the Central Medical War Committee that the British Medical Association up to the end of 1915 had spent no less than £900 on the work of the Committee, while a motion to ask the Government for reimbursement was patriotically rejected.

## THE EARLY DIAGNOSIS OF PULMONARY TUBERCLE.

THE difficulties attending the early diagnosis of pulmonary tubercle in certain cases are well recognised, but since the welfare of the patient depends on a prompt recognition of his condition the difficulties have much exercised the mind of the profession, as various important clinical and laboratory methods bear witness. A new method has been worked out by Professor Carlo Martelli, of the University of Naples, and is described in the issue of *Il Policlinico* of July 9th (Practical Section). Briefly, the technique consists of the following steps: (1) To promote bronchial secretion and expectoration by means of iodides, one-half to one gramme daily, given with decoction of senega and syrup of ipecacuanha for two or three days; (2) to collect the sputum, 100–200 or more c.c., and homogenise it with an equal quantity of antiformin for two to four hours in a thermostat; (3) thoroughly to centrifugalise the material in conjunction with repeated washings with physiological salt solution; (4) to make smears of all the residue, staining the preparation with Ziehl's carbol-fuchsin in the ordinary way and another after Much's method for granules. Professor Martelli claims that this technique will reveal the presence of scanty bacilli and collections of Much granules in cases where neither clinical nor ordinary bacteriological methods are sufficient to form a diagnosis. We question whether it is ever necessary to resort to the induction of an iodide bronchial catarrh which may indeed in certain cases reveal bacilli, but only at the expense of turning a "closed" case into an "open" one. If there is close coöperation between the clinician and the laboratory expert, ensuring the obtaining of the most suitable specimens of sputum for examination, we believe that the tubercle bacilli, when present, will rarely fail to be found by ordinary means. Experience shows that bacilli are rarely revealed by the antiformin method when not discovered in direct films.

## TETANUS DUE TO THE USE OF CATGUT.

ONE of our correspondents in Scotland described in THE LANCET of July 1st (p. 33) the establishment of a factory in Edinburgh for the manufacture of surgical catgut, a product for which we depended on Germany before the war. He stated that the manufacturer had found it impossible to produce from catgut, obtained under septic conditions, a sterile ligature by means of a subsequent medication after the strings had been twisted and dried without impairing the tensile strength. The difficulty of sterilisation is illustrated by an unfortunate case reported to the Académie de Médecine of Paris on June 20th by M. Charles Nicolle and M. Henri Bouquet. A woman, aged 47 years, was admitted to the French Civil Hospital, Tunis, with a large umbilical hernia, partly reducible. Morestin's operation for radical cure was performed, a transverse incision being made above and below the umbilicus, when a large flap of skin and fat was removed. When the sac was opened the omentum was found adherent and was resected after ligature with catgut. The intestine was not seen. The sac was resected and closed. The aponeuroses were united by three catgut sutures. The wound in the skin was closed by metallic sutures and Michel's clasps. A small drain was inserted at each end. The drains were removed on the third day and the patient did well until the sixth day, when, although the wound

looked well, the temperature rose to 101·1° F. On the seventh day she refused food because of "pain in the throat, and wry-neck." On the eighth day there were trismus and attacks of opisthotonos. The wound still looked well, but there was a slight purulent discharge from the point of drainage on the left side. Death took place on the ninth day in spite of serum treatment instituted two and a half days after the appearance of symptoms of tetanus. After death the wound was opened. In the position of the aponeurotic suture the tissues were greyish and there was a little pus. Two catgut sutures were removed, and after wiping with gauze were sent in sterile tubes to the Pasteur Institute. There the catgut was washed in normal saline solution and desiccated at a temperature of 98·6° F. for eight hours. It was then broken up in a little bouillon and inoculated with some drops of the latter in the muscles of the thigh of two guinea-pigs and two mice. After an incubation period of 48 to 72 hours tetanus appeared in all the animals. It rapidly became generalised in the mice, who succumbed on the fifth day, but it remained local in the guinea-pigs. There was therefore no doubt that the patient's death was due to the presence of tetanus spores in the catgut. This had been obtained from an important French house in sealed tubes, and the anhydrous vapours of acetone had been used to sterilise it. It is noteworthy that at a recent meeting of the Académie de Médecine a well-known surgeon, M. Quénu, declared that he had never experienced any serious accidents due to the use of catgut.

## EXOPHTHALMOS IN LEUKÆMIA.

Dr. C. Schiötz describes (*Tidsskr. f. d. Norske Laegeforening*, Christiania, 1916, xxxvi., 545, 601) the case of a cellulose worker, aged 22, who had an attack of "influenza" at the beginning of 1915 and remained unwell thereafter. During May and June he was ill in bed, with headache, chilliness, dizziness, and increasing exhaustion, while his sight became very bad for a time. Early in August his eyes began to protrude from their orbits, and diplopia and epiphora were noted. He went into hospital and was found to have an enlarged liver, though the spleen could not be felt and the lymphatic glands were but little enlarged. The blood count showed 1,600,000 red cells per c.mm. and 84,000 white cells, of which three-quarters were large lymphocytes 13 to 17 $\mu$ in diameter, 16 per cent. were small lymphocytes, 8 per cent. neutrophile cells; the red cells varied considerably in size and shape. Both eyes protruded, particularly the right, and showed limited movements. Both conjunctivæ were chemotic, on the right side so much so that the eye could not be closed. The optic discs looked cloudy and were swollen two diopters high; there were hæmorrhages round the right disc. Examination of the patient's thorax with the Roentgen rays showed a general enlargement of the bronchial lymphatic glands on the right side. The patient was given arsenic, and at the same time was treated with the Roentgen rays, the orbits, hepatic region, and splenic region each receiving four exposures. So far as the eyes were concerned, the result was excellent; the exophthalmos and chemosis entirely disappeared within a fortnight. The patient continued to have headache at times, however, and the blood count exhibited little or no improvement, the percentage of hæmoglobin, measured by Sahli's method, falling in five weeks from 45 to 25; Dr. Schiötz notes that the temperature chart from time to time was just like that of tertian malaria, attacks of fever up to 102·4° F. recurring at intervals of 48 hours for several days together. Discussing the etiology of exophthalmos in leukæmia, he says that it is commonly attributed to the presence of lymphomas within the orbits. Dissatisfied with this explanation, he develops at some length the view that it may be a toxic phenomenon, and may result from the action of a toxin produced by the unknown infecting agent that causes leukæmia. He quotes the case of a farmer, aged 48, whom he saw in 1914, who developed slight exophthalmos apparently as the result of smoking too much tobacco (15 to 20 pipes a day), and notes that nicotine poisoning can produce widening of the palpebral fissure and protrusion of the eyeball in experimental animals. Other drugs capable of causing exophthalmos are adrenalin, paraphenylene diamine, salvarsan, tetrahydronaphthylamine, and dionin. Among the diseases in which exophthalmos may sometimes occur are Ibrahim's primary chronic arthritis of children, lead poisoning, malaria, pellagra, and leukæmia. Dr. Schiötz points out that all the drugs he mentions are amino bodies, and he argues that probably something is amiss with the metabolism in the diseases in which exophthalmos sometimes occurs, with the result that toxic amino bodies, perhaps connected with the purins, find their way into the circulation and cause protrusion of the eyeballs. He thinks it doubtful whether this protrusion can be brought about by stimulation of the weak layers of involuntary muscle found in the orbits.

## TRICHINÆ IN THE CEREBRO-SPINAL FLUID.

OVER two years ago Dr. William Lintz, of Long Island College Hospital, demonstrated for the first time the trichina spiralis in the cerebro-spinal fluid of a patient suffering from trichinosis, and expressed the view that lumbar puncture might prove useful in the diagnosis of the disease. In the *Journal of the American Medical Association* of June 10th he has returned to the subject and pointed out that this discovery has been confirmed by Leon Bloch, Young, and others. It is noteworthy that in the case reported by the latter, while the parasites were demonstrable in the cerebro-spinal fluid, they could not be found in the muscle tissue. Dr. Lintz now reports three more cases in which he found trichinæ in the cerebro-spinal fluid. All the patients were Italians who had eaten infected pork 21 days before lumbar puncture. Typical trichinosis developed. In performing lumbar puncture every precaution was taken not to introduce into the trocar parasites which might be present in the muscles of the back. The trocar was introduced with its stilet, and the latter was withdrawn only after the cerebro-spinal canal was reached. In appearance the fluid was normal and showed no sediment. There was a faint trace of albumin. On centrifugalisation the sediment showed only an occasional lymphocyte and 1 to 4 trichina embryos per field. These were motile and retained their activity to some extent for three days when kept at room temperature. If the trichinæ be found in the cerebro-spinal fluid with some frequency this method should prove useful in diagnosis. In the same number of the *Journal of the American Medical Association* Dr. W. T. Cummins and Dr. G. R. Carson report a case of trichinosis in which, after an exhaustive search of several sedimentised specimens of cerebro-spinal fluid, one sluggish embryo, 0·1 mm. long and 0·006 mm. broad, was found.

# THE ACQUIREMENT OF SINGLE-HANDED DEXTERITY.

MANY limbs have been lost and are still being lost in the present war, and all the resources of modern surgical ingenuity are at work to replace them. Artificial arms and legs may attain a high degree of perfection and their evolution is doubtless not yet complete, but there is this difference between the arm and the leg that, whereas an artificial leg can replace fairly well all the ordinary functions of the real limb and adequately serve for home and business life, the artificial hand as at present evolved can only perform a few of the functions of the real hand whose loss will always be painfully felt so long as its fellow is not specially trained in single-handed dexterity. The experience of those who have lost an arm and who have become expert in the single use of the other should be of help to those who are still novices.

Count Zichy lost his right arm when he was only 14, and 51 years later, at the age of 65, he published at Budapest an illustrated manual which he called the "Book of the One-armed" or "Hints for Developing the Capacity of Becoming Independent with only One Hand." A distinguished Viennese surgeon, Freiherr von Eiselsberg, contributes an introduction to this manual, in which he says:—

I have indeed as a young student already had the opportunity of admiring your inimitable art as piano virtuoso and worthy pupil of your great master, Liszt, and when I had the pleasure in later years of making your personal acquaintance I saw with astonishment of what remarkable skill your single hand was capable. The book, whose clear style and instructive illustrations I as a surgeon can specially value, should be of special interest at the present time when so many are losing an arm. While a foot can comparatively easily be almost completely replaced by an artificial limb this is unfortunately not at all the case with a lost arm. The book will bring comfort to the maimed and will show that, where the will is iron, the loss even of an arm may be lightly borne. In reading your book who will not be reminded of Helen Keller's work, which shows what untiring diligence and practice may effect even when two important senses as sight and hearing are lost. Your book, dear Count Zichy, will certainly help many soldiers to bear their misfortune more easily.

Count Zichy describes in his memoirs the accident which deprived him of his arm. It was at a hunt, and his servant had left two loaded guns leaning against the back seat of the donkey-cart. One of these went off at the shortest possible range, severing the right brachial artery and necessitating a primary amputation. On recovering from the operation the Count was so annoyed at the irritating roughness of his servant who mocked at his helplessness that he chased him from the room and determined to dress alone. He describes the proceeding thus:—

It took me three hours but I succeeded. I made use of the door-handle, articles of furniture, my feet and teeth in order to accomplish it. At table I ate nothing which I could not cut up, and to-day I peel apples, cut my nails, ride, manage a four-in-hand, and with gun and rifle am quite a fair shot. If the grace of God permits me yet time on earth I will write, for the use and benefit of so many young men, the "Book of the One-armed."

Count Zichy then gives exact details in the book, with illustrations, of the various operations, four of which we reproduce here.

His closing words are full of encouragement. While repeating his warning that superhuman patience is necessary to the attainment of one-armed dexterity, he urges the novice to look forward hopefully to a life of independence and usefulness. "You must not pass your life in mourning," he says, "so many posts are open to you. If a soldier of high rank you may indeed continue to serve, particularly with infantry. In every business office you are available. If you are not well off seek a position of trust as overseer, porter, and so forth. If you are a gamekeeper apply to the forester. I am convinced that in a factory one can attain to a certain usefulness and also on a farm."

FIG. 1.

An example of the use of the teeth. One end of the tie is held between the teeth, leaving the hand free to make the loop.

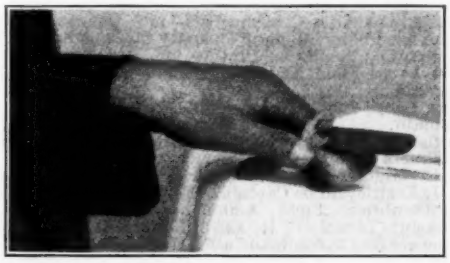
FIG. 2.

Showing a penknife being opened by the thumb and middle finger while held in place against the chest by the index finger.

FIG. 3.

Cutting the nail of the little finger while the thumb keeps the knife in position against the chest and presses on the back of the blade.

FIG. 4.



Peeling an apple. The quarter is held nearly upright, the thumb pressing lightly at the lower end, while the knife begins to cut from the top. The quarter inclines as the cutting proceeds until it finally lies on the plate.

# THE SERVICES.

## ROYAL NAVY MEDICAL SERVICE.

THE following appointments have been notified:—Staff-Surgeons: J. D. Keir to *Hyacinth* and J. R. Clark-Hall to *Dolphin*. Temporary Surgeons: J. J. Gasperine, W. W. K. Brown, A. W. Walker, and E. M. Harrison.

## ROYAL ARMY MEDICAL CORPS.

Major I. A. O. MacCarthy is retained on the Active List and to be supernumerary.

A. E. Ward to be temporary Honorary Captain whilst employed at the Springburn and Woodside Central Red Cross Hospital.

Temp. Captain G. F. Darker relinquishes his commission.

Temporary Lieutenants to be temporary Captains: T. Perrin, R. D. Lawrie, R. N. Thomson, and C. C. Holman.

Temporary Honorary Captain R. W. Collum relinquishes his commission on ceasing to be employed with St. John Ambulance Brigade Hospital.

Temporary Lieutenants H. Parsons and C. Cooper relinquish their commissions.

Canadian Army Medical Corps: Major W. H. Merritt, from Canadian Artillery, to be temporary Major.

Captains to be temporary Majors: R. M. Gorssline, E. C. Cole, A. W. McPherson, and J. S. Jenkins.

## INDIAN MEDICAL SERVICE.

The King has approved the promotion of R. J. Macnamara from Lieutenant-Colonel to Colonel.

The King has approved the grant of the temporary rank of Lieutenant to Narayan Mahadev Bodas, Jatis Chunder Chukerbuti, Saroj Kumar Sanyal, Bangalore Pasupuleti Balukrishna Naidu, Dhanjishaw Phirozshaw Karaka, A. W. Panton, Abani Mohan Ghosh, Tanguturi Janakiramiah, Philip de Mello, Jehanjir K. Moolan-Feroze, N. B. Kolsavala, Chembil Vittil Appunni Menon, A. C. L. La Frenais, Jesuduson Sellyah David, Munguldas Tuljaram Khandwalla, Kalyanpur Harihar Bhat, Premai Trambakrai Majmundar, and Rustom Pestonjee.

## SPECIAL RESERVE OF OFFICERS.

*Royal Army Medical Corps.*

Cadets to be Lieutenants: W. L. Ingham and C. W. Dudley, from Leeds University Contingent, Officers Training Corps; C. Rudd, from Birmingham University Contingent, Officers Training Corps; H. G. Broadbridge, from University of London Contingent, Officers Training Corps; W. C. C. Easton, from the Manchester University Officers Training Corps; and the following from the Edinburgh University Officers Training Corps: M. Foster, J. Bennet, A. K. Gibson, B. J. Ryrie, J. M. Smellie, D. G. Stoute, J. A. Mackenzie, W. N. Greer, D. G. Duff, A. McL. Ferrie, I. MacKenzie, E. A. Mills, C. Milne, J. Milne, C. P. Penberthy, E. W. Fish, W. Corner, and R. R. S. Weatherson.

To be Lieutenants: J. A. Nicholson and M. Stewart.

## TERRITORIAL FORCE.

*Army Medical Services.*

Major (temporary Colonel) F. J. Brown relinquishes his temporary rank on vacating the appointment of Assistant Director of Medical Services.

*Royal Army Medical Corps.*

East Anglian Field Ambulance: D. F. Torrens to be Lieutenant.

London General Hospital: Captain C. A. Pannett is seconded while holding a temporary commission in the Royal Army Medical Corps.

Wessex Casualty Clearing Station: Lieutenant C. A. Raison, from South Midland Casualty Clearing Station, to be Lieutenant.

East Lancs Field Ambulance: Lieutenant C. Hibbert to be Captain.

West Lancs Field Ambulance: Lieutenant R. Findlay to be Captain.

Lowland Casualty Clearing Station: D. Cameron and J. Chalmers to be Lieutenants.

North Midland Casualty Clearing Station: Lieutenant C. S. J. Kearney to be Captain.

Northumbrian Field Ambulance: Major (temporary Lieutenant-Colonel) P. R. Ash relinquishes his temporary rank on ceasing to command a Field Ambulance.

West Riding Field Ambulance: Captain (temporary Major) H. N. Goode relinquishes his temporary rank on ceasing to command a Field Ambulance. Major F. Whalley to be temporary Lieut.-Col. whilst commanding a Field Ambulance.

Wessex Field Ambulance: Major E. B. Bird to be temporary Lieutenant-Colonel whilst commanding a Casualty Clearing Station. Major (temporary Lieutenant-Colonel) E. B. Bird relinquishes his temporary rank on ceasing to command a Casualty Clearing Station.

*Attached to Units other than Medical Units.*—W. A. Milne (late temporary Lieutenant, R.A.M.C.), C. E. Proctor, and P. G. Phillips to be Lieutenants.

## JOURNAL OF THE ROYAL ARMY MEDICAL CORPS.

First place is given in the July issue of this journal to a well-illustrated paper by Captain David Thomson and Captain J. Gordon Thomson on Protozoological Researches, including investigations on the sand in Egypt, undertaken to elucidate the mode of spread of amœbic dysentery and the flagellate diarrhœas. The conclusions of the authors regarding the sanitary measures necessary for the prevention of these diseases are on lines "identical with those required to prevent the other intestinal scourges, such as typhoid fever and bacillary dysentery." The authors advocate a larger sanitary staff in warm climates with bad sanitation. In a paper on the treatment of gonorrhœa Lieutenant-Colonel L. W. Harrison describes successful results from treatment by intramuscular injections of mercury succinimide administered in a 5 per cent. solution either in three doses of 50 milligrammes or two of 75 milligrammes at intervals of three days. A paper on the Surgical and Antiseptic Values of Hypochlorous Acid (Eusol), by Captain John Fraser and Captain H. J. Bates, discusses the use of this antiseptic. Preliminary Observations on Disinfection of the Nasopharynx of Meningococcus Carriers by means of Air Saturated with a Solution of Disinfectant are contributed by Lieutenant-Colonel M. H. Gordon; and a paper on Malingering, by Sir John Collie, deals with the examination of the upper extremities. Fly Traps for Camps, Hospital Precincts, and Trench Areas form the subject of an illustrated paper by Colonel Andrew Balfour, C.M.G., and the Louse Problem at the Western Front is very fully dealt with by Lance-Sergeant A. D. Peacock, M.Sc., formerly entomologist to the Government of Southern Nigeria, lecturer in zoology at the University of Durham.

# VITAL STATISTICS.

## VITAL STATISTICS OF LONDON DURING JUNE, 1916.

IN the accompanying table will be found summarised complete statistics relating to sickness and mortality in the City of London and in each of the metropolitan boroughs. With regard to the notified cases of infectious diseases, it appears that the number of persons reported to be suffering from one or other of the 10 diseases specified in the table was equal to an annual rate of 4·8 per 1000 of the civil population, estimated at 4,310,030 persons; in the three preceding months the rates had been 5·6, 5·3, and 4·7 per 1000 respectively. The lowest rates during the month were recorded in Kensington, Hammersmith, Fulham, the City of Westminster, and Stoke Newington; and the highest rates in Shoreditch, Bethnal Green, Stepney, Bermondsey, and Deptford. The prevalence of scarlet fever showed no variation from that recorded in the preceding month; among the several boroughs this disease was proportionally most prevalent during June in the City of London, Bethnal Green, Stepney, Deptford, and Lewisham. The Metropolitan Asylums Hospitals contained 1256 scarlet fever patients at the end of the month, against 1735, 1608, and 1325 at the end of the three preceding months; the weekly admissions averaged 159, against 208, 190, and 155 in the three preceding months. The prevalence of diphtheria showed only a trifling decrease in June; this disease was proportionally most prevalent in Hampstead, Shoreditch, Bethnal Green, Stepney, Bermondsey, and Greenwich. The number of diphtheria patients under treatment in the Metropolitan Asylums Hospitals, which had been 1417, 1331, and 1242 at the end of the three preceding months, had risen again to 1313 at the end of June; the weekly admissions averaged 152, against, 160, 149, and 152 in the three preceding months. Enteric fever showed a slightly increased prevalence as compared with that recorded in other recent months; of the 35 cases notified during June, 4 belonged to Paddington, 4 to Stepney, 3 to St. Marylebone, and 3 to Hackney. There were 44 enteric fever patients under treatment at the end of June in the Metropolitan Asylums Hospitals, against 46, 39, and 30 at the end of the three preceding months; the weekly admissions averaged 7, against 7, 7, and 5 in the three preceding months. Erysipelas was proportionally most prevalent in Shoreditch, Bethnal Green, Poplar, and Deptford. The 20 cases of puerperal fever included 3 in Greenwich and 2 each in Islington, Holborn, Poplar, Battersea, and Camberwell. The 44 cases of cerebro-spinal meningitis included 5 in Stepney, 4 in Islington, and 3 each in Poplar, Southwark, Bermondsey, and Lambeth. The 4 cases of poliomyelitis belonged respectively to Bethnal Green, Stepney, Bermondsey, and Camberwell.

The mortality statistics in the table relate to the deaths of persons actually belonging to the several metropolitan boroughs, the deaths occurring in institutions having been distributed among the boroughs in which the deceased persons had previously resided. During the four weeks ending July 1st the deaths of 3787 London residents were registered, equal to an annual rate of 11·5 per 1000; in the three preceding months the rates had

## ANALYSIS OF SICKNESS AND MORTALITY STATISTICS IN LONDON DURING JUNE, 1916.

*(Specially compiled for* THE LANCET.)

| CITIE AND BOROUGHS. | Estimated civil population, 1915. | NOTIFIED CASES OF INFECTIOUS DISEASE. | | | | | | | | | | | DEATHS FROM PRINCIPAL INFECTIOUS DISEASES. | | | | | | | | Deaths from all causes. | Death-rate per 1000 living. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Small-pox. | Scarlet fever. | Diphtheria.* | Typhus fever. | Enteric fever. | Other continued fevers. | Puerperal fever. | Erysipelas. | Cerebro-spinal meningitis. | Poliomyelitis. | Total. | Annual rate per 1000 persons living. | Small-pox. | Measles. | Scarlet fever. | Diphtheria.* | Whooping-cough. | Enteric fever. | Diarrhœa and enteritis (under 2 years). | Total. | Annual rate per 1000 persons living. | | |
| LONDON... ... ... ... | 4,310,030 | — | 648 | 607 | — | 35 | — | 20 | 215 | 44 | 4 | 1573 | 4·3 | — | 74 | 7 | 30 | 60 | 7 | 57 | 235 | 0·7 | 3787 | 11·5 |
| *West Districts.* | | | | | | | | | | | | | | | | | | | | | | | | |
| Paddington ... ... ... | 131,397 | — | 20 | 15 | — | 4 | — | 1 | 7 | 1 | — | 48 | 4·8 | — | — | — | — | 2 | — | 3 | 5 | 0·5 | 104 | 10·3 |
| Kensington ... ... ... | 155,795 | — | 21 | 7 | — | — | — | — | 9 | 2 | — | 39 | 3·3 | — | — | — | 1 | 1 | 1 | 3 | 6 | 0·5 | 158 | 13·2 |
| Hammersmith ... ... | 118,559 | — | 11 | 16 | — | 2 | — | — | 1 | 1 | — | 31 | 3·4 | — | 2 | — | — | 4 | — | 2 | 8 | 0·9 | 107 | 11·8 |
| Fulham ... ... ... | 151,161 | — | 22 | 9 | — | — | — | — | 3 | 1 | — | 35 | 3·0 | — | — | — | — | 2 | — | 3 | 5 | 0·4 | 129 | 11·1 |
| Chelsea ... ... ... | 58,421 | — | 9 | 6 | — | 1 | — | — | 2 | — | — | 18 | 4·0 | — | — | — | 1 | — | 1 | 3 | 5 | 1·1 | 57 | 12·7 |
| City of Westminster ... | 135,104 | — | 9 | 7 | — | 2 | — | — | 5 | 1 | — | 24 | 2·3 | — | — | — | — | — | 1 | 3 | 4 | 0·4 | 105 | 10·1 |
| *North Districts.* | | | | | | | | | | | | | | | | | | | | | | | | |
| St. Marylebone ... ... | 100,260 | — | 7 | 13 | — | 3 | — | — | 5 | 1 | — | 29 | 3·8 | — | — | — | 1 | 2 | — | 3 | 6 | 0·8 | 96 | 12·5 |
| Hampstead ... ... ... | 81,760 | — | 11 | 19 | — | — | — | — | — | — | — | 30 | 4·8 | — | — | — | — | 1 | — | — | 1 | 0·2 | 49 | 7·8 |
| St. Pancras ... ... ... | 200,322 | — | 30 | 25 | — | 2 | — | 1 | 9 | 2 | — | 69 | 4·5 | — | 6 | — | 1 | 3 | — | 2 | 12 | 0·8 | 186 | 12·1 |
| Islington ... ... ... | 316,242 | — | 41 | 55 | — | 2 | — | 2 | 16 | 4 | — | 120 | 4·9 | — | 9 | — | 2 | 7 | 1 | 7 | 26 | 1·1 | 294 | 12·1 |
| Stoke Newington... ... | 50,527 | — | 6 | 4 | — | — | — | 1 | 1 | 1 | — | 13 | 3·4 | — | — | — | — | — | — | — | — | — | 43 | 11·1 |
| Hackney ... ... ... | 217,883 | — | 34 | 18 | — | 3 | — | 1 | 13 | 2 | — | 71 | 4·2 | — | 6 | — | — | — | — | 4 | 10 | 0·6 | 190 | 11·4 |
| *Central Districts.* | | | | | | | | | | | | | | | | | | | | | | | | |
| Holborn ... ... ... ... | 40,405 | — | 3 | 8 | — | 1 | — | 2 | 1 | 1 | — | 16 | 5·2 | — | — | — | 1 | — | — | — | 1 | 0·3 | 39 | 12·6 |
| Finsbury ... ... ... | 76,915 | — | 8 | 14 | — | — | — | 1 | 4 | 1 | — | 28 | 4·7 | — | 2 | — | 1 | 2 | — | 2 | 7 | 1·2 | 96 | 16·3 |
| City of London ... ... | 19,461 | — | 7 | — | — | — | — | — | 1 | — | — | 8 | 5·4 | — | — | — | — | — | — | — | — | — | 17 | 11·4 |
| *East Districts.* | | | | | | | | | | | | | | | | | | | | | | | | |
| Shoreditch ... ... ... | 103,627 | — | 22 | 24 | — | — | — | — | 11 | 2 | — | 59 | 7·4 | — | 3 | — | 2 | — | — | 2 | 7 | 0·9 | 109 | 13·7 |
| Bethnal Green ... ... | 120,207 | — | 33 | 31 | — | 1 | — | — | 9 | 2 | 1 | 77 | 8·4 | — | 3 | — | 1 | 1 | — | 1 | 6 | 0·7 | 165 | 11·4 |
| Stepney ... ... ... ... | 265,731 | — | 65 | 66 | — | 4 | — | — | 11 | 5 | 1 | 152 | 7·5 | — | 7 | — | — | 5 | 2 | 1 | 15 | 0·7 | 257 | 12·6 |
| Poplar ... ... ... ... | 156,247 | — | 22 | 25 | — | 2 | — | 2 | 13 | 3 | — | 67 | 5·6 | — | 2 | 1 | 2 | 6 | — | — | 11 | 0·9 | 152 | 12·7 |
| *South Districts.* | | | | | | | | | | | | | | | | | | | | | | | | |
| Southwark ... ... ... | 179,424 | — | 19 | 32 | — | — | — | 1 | 10 | 3 | — | 65 | 4·7 | — | 12 | — | 5 | 1 | — | 2 | 20 | 1·5 | 181 | 13·2 |
| Bermondsey ... ... ... | 117,188 | — | 17 | 28 | — | 2 | — | — | 5 | 3 | 1 | 56 | 6·2 | — | — | — | 3 | 1 | — | 6 | 10 | 1·1 | 104 | 11·6 |
| Lambeth ... ... ... ... | 284,188 | — | 32 | 31 | — | 1 | — | 1 | 8 | 3 | — | 76 | 3·5 | — | 3 | 1 | 1 | 5 | — | 3 | 13 | 0·6 | 255 | 11·7 |
| Battersea ... ... ... ... | 161,945 | — | 29 | 20 | — | 1 | — | 2 | 9 | — | — | 61 | 4·9 | — | 6 | 2 | 1 | 3 | — | — | 12 | 1·0 | 129 | 10·4 |
| Wandsworth ... ... ... | 312,249 | — | 45 | 33 | — | 1 | — | — | 15 | 2 | — | 96 | 4·0 | — | 6 | — | 3 | 5 | — | 1 | 15 | 0·6 | 213 | 8·9 |
| Camberwell ... ... ... | 254,385 | — | 36 | 24 | — | — | — | 2 | 16 | 1 | 1 | 80 | 4·1 | — | 2 | — | 1 | 1 | 1 | 2 | 7 | 0·4 | 203 | 10·4 |
| Deptford ... ... ... ... | 110,299 | — | 29 | 15 | — | 2 | — | — | 9 | 1 | — | 56 | 6·6 | — | 1 | 1 | — | 2 | — | 1 | 5 | 0·6 | 92 | 10·9 |
| Greenwich ... ... ... | 96,385 | — | 8 | 21 | — | — | — | 3 | 6 | — | — | 38 | 5·1 | — | 3 | — | 2 | 2 | — | — | 7 | 0·9 | 89 | 12·0 |
| Lewisham ... ... ... | 164,438 | — | 37 | 19 | — | 1 | — | — | 9 | 1 | — | 67 | 5·3 | — | 1 | 1 | 1 | 3 | — | 3 | 9 | 0·7 | 113 | 9·0 |
| Woolwich ... ... ... | 129,505 | — | 15 | 21 | — | — | — | — | 7 | — | — | 43 | 4·3 | — | — | — | 1 | — | 1 | — | 2 | 0·2 | 115 | 11·6 |
| Port of London ... ... | — | — | — | 1 | — | — | — | — | — | — | — | 1 | — | — | — | — | — | — | — | — | — | — | — | — |

* Including membranous croup.

been 18·1, 17·2, and 12·9 per 1000. The death-rates in June ranged from 7·8 in Hampstead, 8·9 in Wandsworth, 9·0 in Lewisham, 10·1 in the City of Westminster, 10·3 in Paddington, and 10·4 in Battersea and in Camberwell, to 12·7 in Chelsea and in Poplar, 13·2 in Kensington and in Southwark, 13·7 in Shoreditch, and 16·3 in Finsbury. The 3787 deaths from all causes included 235 which were referred to the principal infectious diseases; of these, 74 resulted from measles, 7 from scarlet fever, 30 from diphtheria, 60 from whooping-cough, 7 from enteric fever, and 57 from diarrhœa and enteritis among children under 2 years of age. No death from any of these diseases was recorded during the month in Stoke Newington or in the City of London; among the other boroughs they caused the lowest death-rates in Hampstead, Holborn, and Woolwich; and the highest rates in Chelsea, Islington, Finsbury, Southwark, and Bermondsey. The 74 deaths from measles were 58 fewer than the corrected average number in the corresponding period of the five preceding years; this disease was proportionally most fatal in St. Pancras, Islington, Hackney, Southwark, Battersea, and Greenwich. The 7 deaths from scarlet fever were 11 below the corrected average number, and included 2 in Battersea and 1 each in Poplar, Lambeth, Deptford, Lewisham, and Woolwich. The 30 fatal cases of diphtheria showed a decline of 8 from the corrected average number; of the 30 deaths from this disease 5 belonged to Southwark, 3 to Bermondsey, 3 to Wandsworth, and 2 each to Islington, Shoreditch, Poplar, and Greenwich. The 60 deaths from whooping-cough were 12 below the average; the greatest proportional mortality from this disease was recorded in Hammersmith, Islington, Finsbury, and Poplar. The 7 deaths from enteric fever were equal to the corrected average number, and included 2 in Stepney and 1 each in Kensington, Chelsea, the City of Westminster, Islington, and Camberwell. The 57 deaths from diarrhœa and enteritis among children under 2 years of age were 14 below the corrected average number; this disease was proportionally most fatal in Paddington, Kensington, Fulham, Chelsea, the City of Westminster, St. Marylebone, Islington, Finsbury, and Bermondsey. In conclusion, it may be stated that the aggregate mortality in London during June from these principal infectious diseases was 30·5 per cent. below the average.

### HEALTH OF ENGLISH TOWNS.

In the 96 English and Welsh towns with populations exceeding 50,000 persons at the last Census, 7929 births and 3469 deaths were registered during the week ended Saturday, July 29th. The annual rate of mortality in these towns, which had been 11·1, 10·9, and 11·1 per 1000 in the three preceding weeks, fell in the week under notice to 10·4 per 1000 of their aggregate civil population, estimated at 17,312,295 persons for the year 1915. During the first four weeks of the current quarter the mean annual death-rate in these towns averaged 10·8, against 10·7 per 1000 in London. Among the several towns the death-rate last week ranged from 3·2 in Oxford, 3·4 in Enfield, 3·7 in Wimbledon, 3·9 in Ilford, and 5·5 in Southport, to 14·7 in Middlesbrough and in Burnley, 15·1 in Sunderland, 15·4 in Cambridge, 16·4 in Darlington, and 22·8 in Bury.

The 3469 deaths from all causes were 206 below the number in the previous week, and included 221 which were referred to the principal epidemic diseases, against numbers declining from 335 to 212 in the eight preceding weeks. Of these 221 deaths, 72 resulted from infantile diarrhœal diseases, 64 from measles, 36 from whooping-cough, 35 from diphtheria, 9 from scarlet fever, and 5 from enteric fever, but not one from small-pox. The annual death-rate from these diseases was equal to 0·7, against 0·7, 0·7, and 0·6 per 1000 in the three preceding weeks. The deaths attributed to infantile diarrhœa, which had been 54, 51, and 46 in the three preceding weeks, rose to 72, of which 16 occurred in London and 5 in Liverpool. The deaths from measles, which had been 60, 62, and 59 in the three preceding weeks, rose last week to 64, and included 14 in London, 11 in Sheffield, 6 in Liverpool, 5 in Manchester, and 4 in West Ham. The fatal cases of whooping-cough, which had been 61, 40, and 42 in the three preceding weeks, fell to 36, and included 4 each in London, Birmingham, and Liverpool, and 3 in West Ham. The deaths from diphtheria, which had been 36, 47, and 43 in the three preceding weeks, fell to 35 last week, and included 12 in London, 3 in St. Helens, and 3 in Middlesbrough. The deaths from scarlet fever, which had been 4, 15, and 17 in the three preceding weeks, fell to 9 last week, of these 9 deaths 3 belonged to London. The fatal cases of enteric fever, which had declined from

13 to 5 in the five preceding weeks, were again 5 last week and showed no excess in any particular town.

The number of scarlet fever patients under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, which had declined from 1303 to 1216 in the five preceding weeks, rose slightly to 1221 on Saturday last; 171 new cases were admitted during the week, against 170, 150, and 172 in the three preceding weeks. These hospitals also contained on Saturday last 1288 cases of diphtheria, 184 of measles, 153 of whooping-cough, and 40 of enteric fever, but not one of small-pox. The 878 deaths from all causes in London were 17 fewer than the number in the preceding week, and corresponded to an annual death-rate of 10·6 per 1000. The deaths referred to diseases of the respiratory system, which had been 95, 117, and 99 in the three preceding weeks, fell to 90 in the week under notice.

Of the 3469 deaths from all causes in the 96 towns, 136 resulted from violence, 296 were the subject of coroners' inquests, and 1054 occurred in public institutions. The causes of 31, or 0·9 per cent., of the total deaths were not certified either by a registered medical practitioner or by a coroner after inquest. All the causes of death were duly certified in London and its 14 suburban districts, in Bristol, Leeds, Sheffield, and 60 other smaller towns. Of the 31 uncertified causes, 7 were registered in Birmingham and 6 in Liverpool.

### HEALTH OF SCOTCH TOWNS.

In the 16 largest Scotch towns with an aggregate population estimated at 2,372,000 persons at the middle of this year, 1029 births and 566 deaths were registered during the week ended Saturday, July 29th. The annual rate of mortality in these towns, which had been 12·4, 12·6, and 11·2 per 1000 in the three preceding weeks, rose to 12·5 per 1000 in the week under notice. During the first four weeks of the current quarter the mean annual death-rate in these towns averaged 12·2, or 1·4 per 1000 more than that recorded in the large English towns. Among the several towns the death-rate last week ranged from 5·7 in Perth, 9·0 in Dundee, and 9·2 in Coatbridge, to 17·4 in Greenock and 18·7 in Hamilton and in Ayr.

The 566 deaths from all causes were 55 above the number in the previous week, and included 37 which were referred to the principal epidemic diseases, against 44 and 39 in the two preceding weeks. Of these 37 deaths, 15 resulted from infantile diarrhœal diseases, 7 from measles, 6 from diphtheria, 5 from scarlet fever, and 4 from whooping-cough, but not one from either small-pox or enteric fever. The annual death-rate from these diseases was equal to 0·8, against 0·7 per 1000 in the large English towns. The deaths attributed to infantile diarrhœal diseases, which had been 5, 8, and 7 in the three preceding weeks, rose last week to 15, and included 9 in Glasgow, 3 in Edinburgh, and 2 in Ayr. The deaths from measles, which had declined from 19 to 18 and 17 in the three preceding weeks, further fell to 7 last week, and included 5 in Glasgow. The fatal cases of diphtheria, which had been 5, 3, and 6 in the three preceding weeks, were again 6 last week; 2 deaths occurred in Glasgow and 2 in Edinburgh. The deaths from scarlet fever, which had been 5, 7, and 3 in the three preceding weeks, rose to 5 last week, and included 3 in Glasgow The fatal cases of whooping-cough, which had been 8, 8, and 3 in the three preceding weeks, were 4 last week; all 4 deaths were registered in Glasgow.

The deaths referred to diseases of the respiratory system, which had been 64, 50, and 62 in the three preceding weeks, declined to 40 in the week under notice, and were 6 below the number registered in the corresponding week of last year. The deaths from violence numbered 32, against 16 and 22 in the two preceding weeks.

### HEALTH OF IRISH TOWNS.

In the registration area of Dublin 193 births and 110 deaths were registered during the week ended Saturday, July 29th. The annual rate of mortality, which had been 17·6, 18·8, and 15·2 per 1000 in the three preceding weeks, fell to 14·4 per 1000 in the week under notice, against 10·6 and 12·4 per 1000 in London and Glasgow respectively.

Of the 110 deaths at all ages, 22 related to infants under 1 year and 25 to persons aged 65 years and upwards. Four deaths of infants (under 2 years of age) were referred to diarrhœal diseases.

The causes of 4 deaths were uncertified, and 4 others were the subject of coroners' inquests, while 49, or 45 per cent., of the total deaths occurred in public institutions.

During the same period 155 births and 93 deaths were registered in the city of Belfast. The deaths corresponded to an annual rate of 12·4, or 2·2 per 1000 less than in the previous week, and included 17 of infants under 1 year of age and 18 of persons aged 65 years and upwards. One death was referred to measles and 1 each to scarlet fever, whooping-cough, and infantile diarrhœal diseases. The cause of 1 death was uncertified and 4 others were the subject of coroners' inquests; 34 deaths occurred in public institutions.

# Obituary.

## SIR WILLIAM HENRY POWER, K.C.B., F.R.S., F.R.C.S. ENG.,

LATE PRINCIPAL MEDICAL OFFICER OF THE LOCAL GOVERNMENT BOARD.

IT is with feelings of the deepest regret that we announce the death, in his 74th year, of Sir William H. Power, K.C.B., who died at his residence in East Molesey on July 28th.

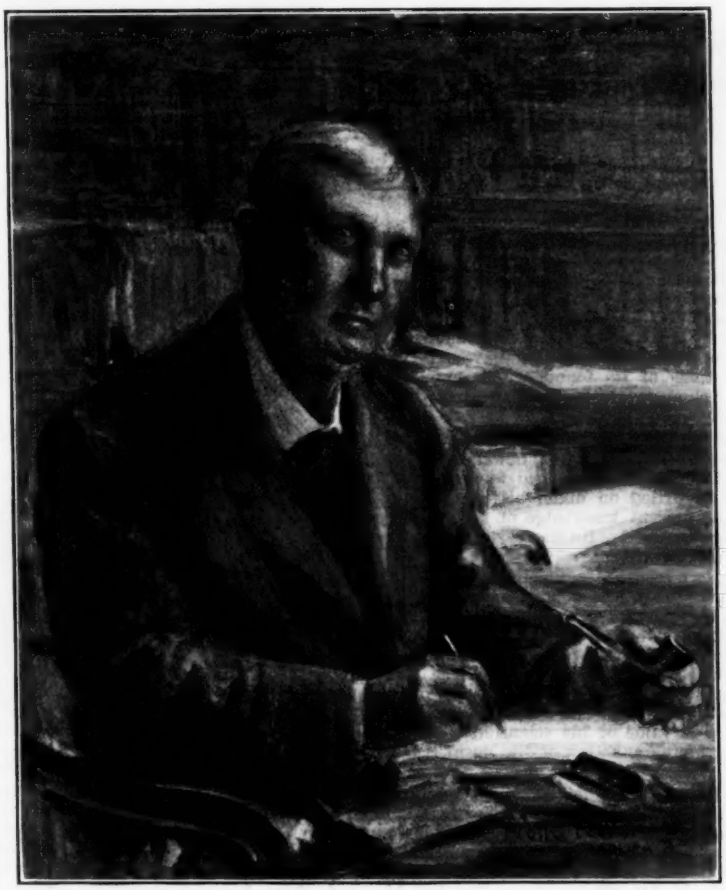
Sir William Power had the distinction of belonging to an old medical family, and was the fifth representative of the profession in direct succession from father to son, beginning with John Power, a surgeon in Warwickshire, born in 1730. He received his early education at University College School, after which he became apprenticed, as a medical student, to his father, Dr. William Henry Power, of Ladywell, Kent. Later, he entered St. Bartholomew's Hospital, and qualified as a Member of the Royal College of Surgeons and as a Licentiate of the Society of Apothecaries in 1864. He devoted the next six years to the practice of clinical medicine and surgery, and held several important hospital appointments. For some years he was resident medical officer to the Victoria Park Hospital for Diseases of the Chest, and here he acquired that intimate knowledge of pulmonary tuberculosis which proved so useful to him in his subsequent investigations of problems associated with that disease. By a strange coincidence, Power commenced his life's work in the very year that the Local Government Board was created by joining the medical department, as a temporary medical inspector, in 1871. In that year the medical department of the Privy Council had been transferred to the newly formed Local Government Board, and comprised such well-known men as John Simon, Seaton, Buchanan, Thorne, Netten Radcliffe, and Ballard. With these distinguished men as colleagues Power commenced a public health career, which was destined to be fruitful in advancing our knowledge of all branches of preventive medicine and in evolving the organisation of the public health administration of this country. The aims and objects of these pioneers were well expressed in the writings of Sir John Simon, who stated: "I believe we had the credit of earnestly endeavouring to learn the truth, and tell the truth, as to the matters which our inquiries regarded." Power was a real prophet and professor of truth. He possessed in a remarkable degree the faculty of observation, doubtless first awakened by a love of natural history which remained with him a passion throughout his life, while his ability to weigh facts and adduce from them correct conclusions has rarely, if ever, been excelled by any worker in medical research. These rare gifts were applied by him in elucidating many problems connected with infectious diseases, the far-reaching results of his work in this connexion being well known to every student of public health.

Perhaps one of the most striking of Power's inquiries was that in relation to the part played by small-pox hospitals in influencing the distribution of the disease in their neighbourhood. He found that increased incidence of small-pox in the surrounding districts followed the admission of acute cases into Fulham Hospital, and that if the surrounding area were divided into zones by means of circles drawn upon the map, with the hospital as a centre, and a quarter, half, three-quarter, and one-mile radii respectively, the proportion of invaded houses to the total number of houses in each zone diminished as the distance from the hospital increased, and that this relation held good in each quadrant of each zone. The distribution of the cases was not such as to suggest any relation to lines of traffic to and from the hospital or to ambulance routes. These remarkable facts formed the basis of the theory of aerial convection of small-pox infection which was formulated by Power and led to results of great practical importance. The small-pox hospitals of the Metropolitan Asylums Board were formerly situated within, or in the outskirts of, London, and were in most instances surrounded by thickly populated areas. Power's statistics of small-pox incidence in the registration districts of London during the years 1876–85, relatively to the operation of small-pox hospitals in the metropolis, proved that, for whatever reason, the local distribution and intensity of small-pox during the epidemics which occurred in the period under review had been influenced in large measure by the

proximity or otherwise of the London small-pox hospitals. The figures demonstrated that there were instances in which the opening of such hospitals for the reception of acute cases of small-pox in parts of London hitherto comparatively free from the disease had been followed by severe local outbreaks in the immediate neighbourhood of the hospitals. Subsequently, as is well known, the use of these hospitals in London was abandoned, and all cases of small-pox were removed to institutions situated outside the metropolis. With the inauguration of this departure small-pox ceased to prevail on anything like the scale recorded when the hospitals were within the metropolitan area.

Power was the first to demonstrate that diphtheria could be spread through the agency of milk. The facts on which this conclusion was based are contained in a report to the Local Government Board, dated December, 1878, on an epidemic prevalence of diphtheria in North London. He also showed that milk-borne scarlet fever was not in every case due to specific contamination of the milk from a human source, but that the cow was prone to a disease apparently of a similar character, and that consumption of the milk of such unhealthy animals was capable of producing scarlatiniform disease in the human subject. This hypothesis was first suggested by Power in connexion with a scarlet fever outbreak investigated by him in St. Giles and St. Pancras in 1882, and was definitely established by the circumstances of the classical outbreak in Marylebone and other London districts, in 1885, which was associated with a farm at Hendon. An account of this outbreak appears in the fifteenth annual report of the medical officer of the Local Government Board, dated 1885. One of the most notable instances of Power's remarkable insight into natural phenomena was furnished by his pronouncement in regard to the causes which give rise to the ability possessed by certain waters of dissolving lead. After study of the subject generally, he suggested that the inscrutable behaviour of soft moorland waters in regard to their plumbo-solvent action was probably due to low forms of organic life. Inquiry was then made into the matter, on an extensive scale, by the medical department of the Local Government Board, when Power's hypothesis was abundantly proved, it being shown by Houston that the acidity of such waters and their consequent plumbo-solvent ability were due to the presence of acid-producing bacteria in the peat of the gathering-grounds from which such waters were derived. The elucidation of this problem led to far-reaching results, for, when steps were taken to neutralise the acidity of these plumbo-solvent waters before delivery to the houses of the consumers, lead poisoning, due to dissolved lead in the drinking water, which had been very prevalent in certain of the industrial communities of the north, practically ceased, and is now rarely met with in this country.

In 1887 Power was promoted from the rank of inspector to be assistant medical officer, in which capacity he remained until the retirement in 1892 of Sir George Buchanan, when he became the first assistant medical officer. Following upon the death of Sir Richard Thorne, he was appointed in 1900 Principal Medical Officer of the Board, which office he retained until 1908, when he reached the official age for retiring from the Civil Service. It was while acting as assistant medical officer that he established those intimate personal relations with the medical staff which were largely responsible for the excellent work done by the department during the remainder of his tenure of office. One of the most modest of men, with a physical dread of notoriety, he constantly kept in the background while helping others to attain success—not merely his colleagues at the Local Government Board, but also a large circle of friends who were in the habit of seeking his advice on a wide range of subjects associated with medical problems. In directing the work of the medical inspectors his shrewd judgment of the capacities of each man on the staff enabled him to choose the inspector whose talents were most suited to any particular piece of work which had to be done, while his remarkable powers of intuition and constructive criticism combined with the kindliness of his personality rendered his influence widely felt. It is lamentable that no less than seven of the men whom Power trained as medical inspectors, and who so largely contributed during his time to the strength of his department, have predeceased him. Apart from the three assistant medical officers, the present medical staff unfortunately includes only a few men who had the privilege of being associated with Power in the study of national problems of public health.



SIR WILLIAM HENRY POWER, K.C.B.,
LATE PRINCIPAL MEDICAL OFFICER TO THE LOCAL GOVERNMENT BOARD.
*(Reproduced from a Drawing in Water-colours.)*

Power rightly considered that one of the best methods of securing sanitary reform throughout the country was by

drawing public attention, through official publications, to the conditions obtaining in insanitary districts, and a considerable portion of the time of the medical staff was, in his day, occupied in inquiring into the sanitary circumstances and administration of the more backward districts of England and Wales. We cannot imagine a more valuable work by the central health authority than this, and, as a matter of fact, it led to material improvement in the health conditions of many parts of the country. Sometimes it resulted in local reform, while in other instances the published reports came to form a mass of official evidence which acted as a strong impetus to general legislation or to better central administration in sanitary matters. Another fundamental principle in Power's schemes of reform was to press on his department the necessity of improvement in the education and remuneration of sanitary inspectors. These officers perhaps do not know how great a friend they have lost, for Power seldom told anyone of his accomplished work.

Long before his appointment as assistant medical officer Power was entrusted with the important task of editing the reports appearing in the Annual Reports of the Medical Officer under the heading "Scientific Investigations," and this work he retained, as a labour of love, till the very last, notwithstanding the many and increasing duties which devolved upon him. Many of the inquiries conducted by the Board's medical staff during Power's tenure of office led to the publication of official reports which formed standard works on the subjects with which they dealt—such as, for example, "The Influenza Epidemic of 1889-90," by Franklin Parsons; "Oyster Culture in Relation to Disease," by H. T. Bulstrode. It was mainly through Power's efforts that in 1904 a foods department was established by the Local Government Board on lines which had been carefully thought out by him for a long time beforehand. The results which this new branch has achieved have more than justified the anticipations of its founder, more especially since the outbreak of the present war, during which it has rendered valuable services to the State.

On the death of Sir Richard Thorne, Power was appointed a member of the Royal Commission on Sewage Disposal. The scientific work of the experts employed by the Commission was, in great part, carried on under his direction and forms the basis of our present knowledge of the principles and practice of sewage disposal. He was closely associated with the work of the Royal Commission on Tuberculosis (Human and Bovine), while the late Sir Michael Foster was its chairman, and on his death was nominated to the chair of that Committee. He acted for some years as the Crown nominee on the General Medical Council. He was the recipient of the Jenner medal of the Epidemiological Society of London, the Bisset-Hawkins medal of the Royal College of Physicians, London, the Stewart prize of the British Medical Association, and the Buchanan medal of the Royal Society. The value of his scientific work was recognised by his election as a Fellow of the Royal Society in 1895.

In his early days Power was, as might be expected from his fine physique, an athlete, and gained some distinction as a cricketer. He was also an adept in the use of the gun and found some relaxation in duck-shooting during the few short absences which he allowed himself from official duty. He was married early in his official career, but lost his wife after only four years of married life. He leaves two daughters.

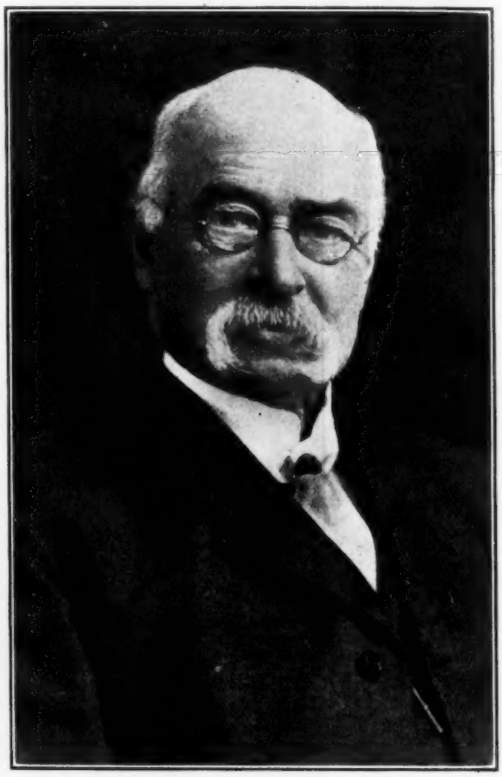
It is difficult to do justice to the memory of Sir William Power. While respected by all and beloved by those who had the privilege of coming intimately in contact with him, it is probable that, owing to his retiring disposition, few have recognised, at its true value, the importance of his achievements, which were so silently accomplished. It was perhaps only among his own staff that the wide scope and effect of his work were fully known and appreciated. Medicine, more than any other science, has attracted from the earliest times men of outstanding ability and originality of thought, who have devoted their lives to study of the phenomena presented by the human subject in health and disease. To few such men has nature yielded her secrets more abundantly than to Sir William Power, whose work in the cause of hygiene will ever be an inspiration to those who promote the welfare of their fellow-creatures by helping to maintain and improve the public health.

## THOMAS JAMES WALKER, M.D. LOND., F.R.C.S. ENG.,

CONSULTING SURGEON TO THE PETERBOROUGH INFIRMARY.

THE death of Dr. T. J. Walker, of Peterborough, deprives the ranks of general practitioners of one of their oldest and most distinguished members.

Thomas James Walker was born in 1835 at Peterborough, where his father was a well-known medical man; he came of a strong stock, for both his parents passed the age of 90. He was educated at the University of Edinburgh, was a demonstrator of anatomy to Goodsir, and graduated at the University of London, carrying off the University gold medal in physiology at the first M.B. examination and that for medicine at the final examination in 1857. After graduating he was appointed medical tutor at Queen's College,



THOMAS JAMES WALKER, M.D. Lond.

Birmingham, which had just been founded, and was subsequently elected assistant physician to the Queen's Hospital. He was urged to practise in Birmingham as an obstetric physician, but he felt it his duty to join his father in general practice. Before doing so he went to Vienna for six months, and there he was especially attracted by laryngology, Czermak having just demonstrated the clinical value of the laryngoscope. Walker's interest in this subject never flagged. In THE LANCET of Nov. 9th, 1861, he published the first case, in England, in which a laryngeal polypus was removed; 20 years later at the International Medical Congress in London in 1881 he was one of the secretaries of the Section of Laryngology; and the last paper he wrote, in 1913, was entitled "A Retrospect of Laryngology, 1860-1910." But when he entered on a busy general practice his tastes grew catholic and he became the rare example of a first-rate all-round man.

For 54 years he spent an extremely busy life and took few holidays. In 1862 he was appointed surgeon to the Peterborough Infirmary and held that office for 42 years, seeing in- and out-patients with the utmost regularity, and, although there were only a few beds, he utilised his opportunities to the utmost. He was always on the look-out for new methods and fresh ideas; he was a successful ovariotomist in the early days of that operation, and was one of

the first in this country to perform gastro-jejunostomy successfully. He adopted Listerian methods when they were introduced, and had the operating theatre of the infirmary reconstructed that he might adapt his methods to the teachings of the aseptic school. He was a neat and successful operator, and was a particularly dexterous lithotomist at the time when vesical calculus was a common complaint in the Eastern counties—a local feature which seems to be disappearing. His reputation spread rapidly, and his services as an operator and his advice in consultation were sought by colleagues over a wide area. He had little leisure for literary work beyond the narration of interesting single cases in the journals; two papers, however, which broke new ground ought to be mentioned. In the Transactions of the Royal Medical and Chirurgical Society for 1889 he published a paper on Colourless or Clay-coloured Stools Unaccompanied by Jaundice, connected with Disease of the Pancreas, which proved the undisputed part played by the pancreas in the colouration of the stools. In 1905 he published in the Clinical Transactions a series of cases of Acute Ascending Paralysis in Patients Suffering from Chronic Cystitis. He also wrote the articles on Diseases of the Larynx in the first edition of Quain's "Dictionary of Medicine." When the Royal Society of Medicine was founded he was one of the first members of council, and he was more than once elected President of local branches of the British Medical Association, for his high position in his own district was not due to his professional attainments alone. His character and his high ideals earned him universal respect, while his firm, kindly manner and his considerate thoughtfulness endeared him to all his patients. Rich and poor alike knew that he took a real personal interest in them, and many of them would seek his advice in circumstances of difficulty which had no relation to medicine.

Amid the heavy calls of practice Dr. Walker cultivated other interests. A learned archæologist, he formed a valuable collection of Saxon and Roman remains, found near Peterborough, and bequeathed them to the city. He recently spent most of his scanty leisure in researches, both locally and at the Public Record Office, into the history of French prisoners of war in Napoleonic times, a large detention camp having existed for some years at Norman Cross, near Peterborough. These researches were embodied in a book, "The Depôt for Prisoners of War at Norman Cross, Huntingdonshire, 1796–1816," which is of interest at the present time, as its pages show by contrast how much more humane are the methods now adopted in this country in dealing with prisoners of war. He was an enthusiastic Volunteer in the early days of the movement, went to camp every year with his battalion, and ultimately became lieutenant-colonel and received the V.D. It is interesting to note that six of his sons are serving in the Navy or Army in the present war. He threw himself energetically into all local schemes for social improvement and was a sober advocate of temperance. He was a good rider and keen sportsman. On his eightieth birthday his city honoured him by making him an honorary freeman, and a few months later his portrait was presented to him by public subscription.

Until recently there was no abatement of his energy, and in spite of his years he did a day's work which would have tried much younger men. But in the last 18 months troubles came quickly upon him. His wife died after 50 years of happy married life, and a few months later Dr. George Kirkwood, his partner and close friend for 40 years, also died. These blows told on his strength. In June he had a severe feverish attack, which compelled him to take to his bed. His strength failed rapidly, and he died on July 19th. Thirteen children survive him, of whom four have adopted their father's profession—Dr. Walter Walker, Dr. Alec Walker, and Captain J. Walker, R.A.M.C. (T.) (who were in partnership with him), and Captain Russell Walker, R.A.M.C.

## BUSHELL ANNINGSON, B.A., M.D. CAMB.,

LECTURER ON MEDICAL JURISPRUDENCE AT THE UNIVERSITY OF CAMBRIDGE.

WITH Dr. Bushell Anningson has passed away, at the advanced age of 78 years, a well-known figure in Cambridge and one associated with the public health administration of the neighbouring districts over a period of 40 years.

Bushell Anningson came of a Lincolnshire family and was born at Idle in Yorkshire. His father was in medical practice in London and wished his son to follow in his own profession, sending him to Gonville and Caius College, Cambridge, in 1865. Anningson early showed his aptitude for his studies, gaining two scholarships when an undergraduate and taking honours in the Natural Science Tripos. He passed his M.B. in 1869, taking the M.D. degree in 1877 with a thesis upon the Infective Constituents of Vaccine Lymph. In the meantime he was demonstrator to Sir George Humphry, then professor of surgery. In 1875 Anningson obtained his first public health appointment under the Cambridge Improvement Commissioners, and this was the commencement of a series of appointments which ultimately brought under his administration an area exceeding 500 square miles. Most of the sanitary and preventive measures now in operation in the borough of Cambridge were initiated by him, notably the Infectious Diseases Hospital and the sewage works. Although fully occupied in administrative work, Anningson held with distinction teaching appointments in the University of Cambridge. He was lecturer on medical jurisprudence, and one of the earliest teachers of sanitary science in the country. The establishment of the Diploma of Public Health was one of the products of his activity. His merits were recognised by public bodies in this and other countries. He was University delegate at the Hygienic Congress at Budapest in 1894 and at Madrid in 1898; he was an associate of King's College, London, and of the Société d'Hygiène of France, and a member of the council of the Royal Sanitary Institute. Anningson was an indefatigable worker, and it was in the midst of his strenuous work that he died. He contributed articles to many journals, and of other works published by him we may mention the "Evolution of Human Communities in Relation to Disease," and the "Origin and Progress of Sanitary Endeavour."

In 1888 Dr. Anningson married the only daughter of Mr. Samuel Davy, of Christchurch, who survives him.

## THE LATE DR. W. W. H. TATE.

IN reference to the obituary notice of Dr. Tate, which appeared in our last week's issue, Dr. Herbert Spencer writes:—"I knew Walter Tate well for more than 30 years. He obtained his first resident appointment at University College Hospital in 1888, a few months after I was elected to the staff, and afterwards he became house physician and resident medical officer to the hospital; in all these appointments he was assiduous in the performance of his duties and most popular with patients, nurses, students, and staff. Ever since those days, in which he laid the foundation of a successful gynæcological career in a wide general training, I have watched his work with admiration and maintained an unbroken and unclouded friendship, which, cut short by the hand of death, leaves a feeling of sadness and grief, assuaged by the sweet memory of a man of high principles and honour, a charming personality, and one of the best and most unselfish men I ever knew. Appointed to St. Thomas's Hospital, and succeeding Dr. Cullingworth at an early age, Walter Tate soon acquired an extensive experience in gynæcology, in which he was a skilful and successful operator, and made many valuable contributions to literature. He was devoted to his hospital work and took much pains in teaching the students, with whom he was very popular. Equally devoted to him were his private patients of all ranks, who could not fail to appreciate his kindness, geniality, sound judgment, honesty, and skill. Bold in performing necessary operations, he was averse from performing those which his experience, judgment, and humanity led him to know to be of doubtful utility. Though devoted to no 'sport,' Walter Tate had in an unusual degree the faculty of warming both hands at the fires of life, work and play, in both of which he took great pleasure. His 'play' of late years took the form of motor trips through many parts of England and in social meetings with his friends. Some of his excellent professional work is recorded in transactions and journals; the memory of his genial, cheerful, charming, and sterling personality will ever remain enshrined in the hearts of his friends."

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL (UNIVERSITY OF LONDON).—The Burney Yeo scholarships for 1916 have been awarded to Robert Roberts, B.A., Balliol College, Oxford; J. Myles Bickerton, B.A., Pembroke College, Cambridge; and Geoffrey Arthur Harrison, B.A., Gonville and Caius College, Cambridge.

# Correspondence.

"Audi alteram partem."

## THE WORK OF THE REGISTERED HOSPITALS FOR THE INSANE.

*To the Editor of* THE LANCET.

SIR,—I have read with great interest Dr. Henry Rayner's protest against the small amount of charitable work done by some of the registered mental hospitals in England. I think he will agree that this has for a long time been well known to all engaged in consultative work in mental medicine, and I was disappointed in noting his definite statement that the Board of Control had no power to compel some of these institutions to live up to the purpose for which they were originally licensed. We know well those institutions which are doing true charitable work, in spite of not being able to make their actual earnings meet their yearly expenditure, but we also know the difficulties we often experience in our attempts to get deserving cases taken into some registered hospitals at a small weekly payment. The poor middle-class mental patients have of late years been able to gain admission to many of our rate-supported asylums at a minimum charge of £1 1*s.* to £1 5*s.* a week, and we have in the many cases coming to us welcomed this help. I fear, however, even in the case of some of these public asylums there has developed a tendency to build palatial annexes out of the ratepayers' money and enter into competition with private institutions with large amounts of capital invested. I only heard the other day from a very reliable source of one such public asylum receiving patients paying very high terms, and I know that to get a deserving case into this institution at a small weekly payment is often not at all an easy thing to do. I believe I am stating a fact when I say that many of the private asylums of this country do more real charitable work than those institutions which were given a licence on the specific understanding that their profits should be utilised to help those who could not afford more than a small weekly sum.

The great fact that must be continually brought forward in all these discussions is that, according to the reports of the Commissioners in Lunacy, the recovery-rate of mental diseases is to-day no higher than it was in the "seventies" of the last century. The ever-increasing difficulty in getting mental cases with small means quickly under skilled care must, I feel sure, account to a great extent for this lamentable fact.

If the Board of Control have no existing powers to remedy this evil, surely it would not be difficult to get a small Act passed enabling them to have more real authority over these institutions. I am, Sir, yours faithfully,

L. A. WEATHERLY, M.D. Aberd.

Bournemouth, July 29th, 1916.

## AORTIC INCOMPETENCE, DIGITALIS, AND THE WAR-WORTHY HEART.

*To the Editor of* THE LANCET.

SIR,—So long ago as 1829 Hodgkin concluded, from his own experience,[1] that neither blood-letting nor digitalis was advisable in cases of "retroversion of the aortic valves." Corrigan, with whose name aortic incompetence is frequently associated, contrasted aortic with mitral lesions, and regarded digitalis as dangerous in cases of "inadequacy of the aortic valves."[2] In all subsequent discussion on this point there has been that defence of, and objection to, the use of digitalis in aortic incompetence which denotes a theme marked by uncertainty based on experience. Perhaps the most satisfactory and tersely expressed opinion on the subject is that of the late Sir William Broadbent when he states[3] that digitalis is only useful in cases of aortic regurgitation manifesting "mitral symptoms"—in other words, when the power of the ventricle to fulfil its functions efficiently has waned. That digitalis under any circumstances is only indicated when cardiac force has ceased to be equal to propulsive need will scarcely be questioned. Dr. Seymour Taylor, in his interesting paper in THE LANCET of July 15th, arrives at a sound conclusion when he writes of the "seriousness of aortic regurgitation," and you also echo in the leading article on Aortic Incompetence in your issue of July 22nd a similar opinion, and one which would scarcely have required restatement had not some of recent years, with altogether unjustifiable emphasis, relegated to the limbo of childish conceptions that importance of the mechanical factor in the circulation represented by the valvular apparatus.

I agree with Dr. Taylor that clinical experience is at least as valuable as laboratory research, but the two, on the whole, are very helpful to one another, although the physiologist at times claims a degree of authority in practical medicine which the physician cannot concede. A laboratory study of the development of the heart is, however, very enlightening both as to the value of the valvular apparatus in maintaining the circulation and in sparing the work of the heart. The valves develop late; they are the finishing touch given to the cardiac mechanism. Prior to the completion of the aortic valves the circulation is not steadily progressive but oscillatory, to and fro, see-saw, and this in proportion to the slowness of cardiac action. It is less oscillatory when the circulation is quickened, and more so when it is slowed. There is, indeed, no more perfect picture of Corrigan's pulse than that seen in the developing heart before the aortic valves are competent.

Experimental physiology teaches the same lesson. Marey and Chauveau[4] showed by experiment on the horse that destruction of the aortic valves caused a rise both of intraventricular pressure and heart-rate, while Corrigan noted[5] what we know to be true of the otherwise normal heart affected with aortic valvular disease—namely, that the heart-rate has a high average. Corrigan placed it at 110 beats a minute. As the effect of digitalis is not only to increase muscular tone, but to lower cardiac rate, it finds a useful place only when the power of the heart is diminished and its rate very considerably increased, so much increased that its reduction to 100 or so a minute may be regarded as low. In a paper on the Treatment of Aortic Valvular Disease,[6] I endeavoured to show that lesions requiring increased propulsion, of which aortic incompetency is the best example, need acceleration in action, while those requiring increased aspiration demanded cardiac retardation. While atropin in small doses is the best cardiac accelerant, digitalis is without doubt the best retardant, and may have to be pushed boldly even in aortic incompetence when the heart has failed.

As regards prognosis and work capacity in aortic valvular disease, on which, as on many other points in Dr. Taylor's paper it is not possible to dwell here, much depends upon two factors: (1) the etiology of the condition and (2) the character and amount of the lesion. As regards the first point, an aortic incompetence due to specific disease, with a concurrent obliterative endarteritis, which may be often assumed to exist, is, even in a young subject, of graver prognosis than the same condition arising from rheumatic valvulitis or senile change, unless the cardio-motor (nodal) mechanism be involved. With reference to the amount of lesion, Dr. Taylor writes of one of his cases of aortic regurgitation as showing "accentuation and reduplication of the second sound over the pulmonary artery."[7] Inasmuch as the second sound is due to the closure of the sigmoid cusps of both the pulmonary artery and the aorta, and its reduplication to asynchronous closure of these valves, it is manifest that both valves must have been fairly competent to have yielded the reduplication noted. But the estimation of the amount of valvular lesion is admittedly a difficult matter, yet it should be attempted, unless we adopt the attitude of the cult which regards the valvular state as negligible. This particular heresy, however, promises to be short-lived, and your leading article correctly asserts that "the victim of aortic incompetence must be rigidly excluded from the Army." To this it may be added with equal emphasis, that the bearer of any organic valvular lesion whatever should also be excluded. I have personally had to advise the exclusion from the Army of

[1] London Medical Gazette, vol. iii., p. 442.
[2] Edin. Med. and Surg. Jour., April 1st, 1832.
[3] Heart Disease, p. 117.
[4] Circ. d. Sang, pp. 674–75.
[5] Loc. cit.
[6] Brit. Med. Jour., March 14th, 1896.
[7] Loc. cit., p. 97.

"victims" of valvular disease considered war-worthy by some disciples of the cult in question.

I may refer, in conclusion, to the perplexities of your correspondent, Captain Adolphe Abrahams, whose letter appeared in THE LANCET of July 29th, induced by a study of Captain John Parkinson's paper in your issue of July 22nd, the carefully collected and well-weighed data in which render it valuable. His suggestion of an objectively flawless but essentially inadequate heart is quite in accordance with probability. Some years ago I contributed an article to THE LANCET[s] on Cardiac Inadequacy, borrowing the term from an expression used by the late Sir Andrew Clark in discussing "renal inadequacy." In the paper referred to I examined the question of cardiac inadequacy rather fully. That there is a native difference in organic adequacy will scarcely be disputed, and I agree with Captain Parkinson that only a moiety of the more or less rapid and easily accelerable hearts met with in so-called "soldier's heart" are referable to hyperthyroidism. Sir James Barr's contention that cases of hyperthyroidism without pronounced enlargement of the gland are overlooked is, however, probably correct.

That defective endocrinic tone plays a part in these cases is probable, and is shown by the lack of sustained energy in cardiac action. This loss of tone appears to me to be of neural origin, and the determination of what I have termed the cardio-pulmonary reflex is, I believe, a valuable index to the power of adaptation shown by the heart under exertion. An easily elicited retardation of the heart while unaccelerated, on deep respiration and a rapid return to the normal rate on the cessation of exertion, I have been taught by experience to regard as indicative of that control which denotes good cardio-vascular tone. I therefore find myself quite in accord with Captain Abrahams in ascribing importance to undue prolongation of acceleration after a given work test, and have myself employed it as such and have advised others to do so also. On the other hand, a native cardiac inadequacy without any evidence of organic or persistent disease may quite validly exclude a man from military service.

There can also be little doubt, as Captain Abrahams suggests, and it has before been pointed out, that there is a considerable psychical element in many cases of so-called "soldier's heart." The conditions of modern war are even more calculated to induce the neurasthenic state and bring such tendencies into activity than the conditions of previous wars. The frequent night attacks and high explosives, denoting as they do banished sleep and excessive stimulation, are well calculated to produce shock and disorder, especially, although by no means exclusively, in more highly-strung individuals. The cord tends to vibrate long after it has been struck, and to emit frequently a music far from exhilarating. For this reason the aggregation of neurasthenic cardiopaths in a special Cordarium, such as that which has recently been established at Hampstead, has always appeared to me to be wrong in principle. Such cases can be as well investigated and, I believe, more successfully treated outside an emphasised cardiopathic atmosphere.

I am, Sir, yours faithfully,
ALEXANDER MORISON.

Upper Berkeley-street, W., July 29th, 1916.

## THE SHOCKLESS OPERATION.

*To the Editor of* THE LANCET.

SIR,—I was much interested to read Dr. Manson Fergusson's letter in your issue of July 15th, in answer to my article on this subject. I notice that Dr. Fergusson prefers local anæsthesia with the patient fully conscious to the method advocated in my paper. While this may be an advantage when operating upon hardy Scotch patients, and when a skilled anæsthetist is not easily obtainable, it is not generally speaking, I think, as good a method as that in which the patient is kept unconscious. Very many patients cannot face with equanimity a long operation upon themselves even when pain is entirely absent, and they are liable as the result of fright alone to become faint and collapsed either during, or soon after, the operation. As most second-year students and nurses know from personal experience, it is no slight ordeal to be present at a long operation, even when the subject is someone else. How much more difficult when the subject is oneself! As Dr. Crile has pointed out, a considerable degree of shock may occur from mental anxiety alone, and it is our duty to protect the patient from this as far as possible.

Dr. Fergusson is alarmed at the possibility of the patient's struggling during an abdominal operation, but this should never occur with gas and oxygen if a good anæsthetist is available, and I personally have had no experience of it. The method is, of course, still rather new to many anæsthetists, but I feel confident that great improvements in the production of analgesia with gas and oxygen will occur as the result of increased experience with the method. In America gas and oxygen as a general anæsthetic is being extensively used and is increasing in popularity, and I feel certain that the same will occur in this country, especially in London, where specialism in the administration of anæsthetics has reached its greatest development.

I am glad that Dr. Fergusson has drawn attention to the possible danger from chloroform and adrenalin in association. I have personally never seen any bad results from the combination, but this is probably because I have used only very dilute solutions of adrenalin and very small quantities of $CHCl_3$. I believe, however, that Dr. Fergusson is correct and that $CHCl_3$ should not be given when adrenalin is to be used, as there have been, to my knowledge, one or two deaths which might be attributed to this cause.

I am, Sir, yours faithfully,
London, July 26th, 1916. P. LOCKHART-MUMMERY, F.R.C.S.

[s] THE LANCET, vol. i., 1902, p. 1098.

## DIGITALIS IN AORTIC INCOMPETENCE.

*To the Editor of* THE LANCET.

SIR,—Dr. Seymour Taylor's article on the above subject in your issue of July 15th prompts me to record the following case of aortic regurgitation treated with tincture of digitalis.

A man, about 40 years old, was admitted to hospital on account of dyspnœa and œdema of the legs. This condition was due to morbus cordis, and the presence of aortic regurgitation was evident by the usual signs. There was evidence of the disease being syphilitic. He was put to bed on a restricted diet. Some inconsiderable improvement followed. Digitalis was given with caution. Very definite improvement followed its use. This observation was controlled by a careful record of the daily output of urine. The following figures were obtained:—

| Successive periods. | Duration in days. | Daily amount digitalis given, in minims. | Daily average excretion of urine. |
|---|---|---|---|
| 1 | 8 | None | 740 c.c. |
| 2 | 10 | 15 | 980 ,, |
| 3 | 6 | None | 660 ,, |
| 4 | 9 | 22½ | 1050 ,, |
| 5 | 12 | 22½ | 1070 ,, |

The effect of the drug on the output of urine was apparent 48 hours after its first administration, and the above periods are taken accordingly.

This case illustrates one of the events which may follow the administration of digitalis and it is little more trouble to record than the pulse-rate. When the case presents definite clinical evidence, such as this, of the immediate value of digitalis in aortic incompetence one awaits comprehensive statistics, proving its effect in shortening life, before passing adverse judgment on its value.

I am, Sir, yours faithfully,
GEOFFREY EVANS,
July 15th, 1916. Temporary Surgeon, R.N.

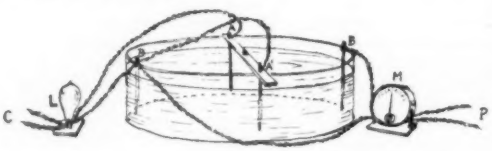
## MEDICAL ELECTRICITY DIRECT FROM THE MAIN.

*To the Editor of* THE LANCET.

SIR,—In THE LANCET of June 10th, p. 1176, a device is described for safely utilising the current from the main for medical purposes by interposing a water resistance. It claims to be something new, but is not water not only one of the best, but one of the oldest forms of resistance for galvanism? It has always been used by electrical engineers, and Professor Leduc—in whose laboratories I first saw it—has always worked very largely with it. The experiments in his book (which was published many years ago and which is now the classic on ionic medication) were worked out entirely with water resistances. Since the

beginning of the war he has been supervising the electrical work in the 100 hospitals of the Loire military district, and the object of this note is to mention his method, because it is different from British methods.

The apparatus in his research laboratory cost him, as he said, "nothing." Anyone who happens to have by them a glass bowl, some bits of carbon and of wire, a lamp, and a spare milliampèremeter, can make one for the same, by arranging them thus:—




The current from the main (C) is taken through a lamp (L) for safety—or 2 lamps. Then to the cylindrical bowl of water (about 6–8 inches × 10–18 inches) and led to 2 carbons A A′ which are on a movable wooden rod. At the position in the diagram nothing passes to the patient—but as A A′ is moved round towards carbons B B′ (which are fixed immovable to the sides of the bowl) the resistance is, of course, diminished, and the current may thus be regulated for the patient (P); the quantity being read off on the milliampèremetre (M).

As there are so many thousands of cases now needing ionic medication it is an advantage to be able to give multiple doses simultaneously. In the Loire district it is a favourite plan to have four patients seated or reclining round a table about 4 feet square, for which some wounded carpenter has made a double top, with a space of about 7 or 8 inches in between. Four glass bowls of similar depth are set upon the lower shelf. Four circles are cut out of the upper shelf over them. These act as lids, and also can be twisted round to carry the movable carbons. The current enters the under-shelf, and as nearly all war wounds do better with a current that is interrupted, it is passed through a metronome which is fixed on the middle of the top shelf. From here it is divided up and passes to the four separate resistances for the four separate patients.

As a practising electrician who has for the past 14 years treated all wounds (excepting those of viscera) from the earliest possible moment after infliction with static and galvanic electricity, I would consider some such apparatus as the above one of the absolute essentials in the best treatment of any wound.

I am, Sir, yours faithfully,

London, July 10th, 1916. ETTIE SAYER.

## MOUTH HYGIENE IN THE ARMY.

*To the Editor of* THE LANCET.

SIR,—During the month of February, 1916, I kept a careful record of the condition of the teeth and gums of nearly all the cases admitted into my field ambulance. Those cases, of which no record was kept, were either severely wounded or cases which were rapidly evacuated to the casualty clearing station, owing to their serious condition. This meant that those cases whose mouths and teeth were possibly in a bad condition *due to serious illness* were eliminated from any calculation. The following is the result of the notes which I kept:—

| | |
|---|---|
| (*a*) Number of men admitted whose teeth showed no signs of having been cleaned ... ... ... ... ... ... ... ... ... ... ... | 279 |
| (*b*) Number of men admitted with illness which might have been either caused or aggravated by the very foul and septic condition of their teeth and gums ... ... ... ... ... ... ... ... | 66 |
| (*c*) Number of men admitted whose teeth showed signs of being brushed fairly regularly... ... ... ... ... ... ... ... ... | 76 |
| (*d*) Number of cases of which no record of the condition of teeth was made ... ... ... ... ... ... ... ... ... ... ... ... | 61 |

For the first half of this month, when the above records were taken, the troops were out of action, in rest well behind the firing line, and were where they had ample supplies of water. For the latter half of the month the division was in action, where possibly water was not so plentiful, but the records for the two periods show a smaller number of cases admitted under (*b*) heading during the latter period, when they were in action, and the supply of water was less plentiful. So 66 cases came into one field ambulance with symptoms which, in the opinion of the medical officers in charge of the cases, and in my opinion, were due to the neglected state of their teeth. If to avoid the risk of overstating the case we say that only in 50 of these cases was the condition due to the foul neglected state of their teeth and gums, it can be estimated that some thousands every month are admitted into field ambulances with symptoms due to neglect of mouth hygiene.

The R.A.M.C. has done wonders in this war in keeping down the admission rate of serious diseases, and even a liberal number of dentists are being provided to look after the men's teeth; but it appears to me that the subject has to a large extent been overlooked, possibly because at first sight it may not seem of great importance, and secondly because, no doubt, it is not a congenial task for regimental officers to examine their men's teeth; but in my opinion they should have the necessity for doing this pointed out to them in the strongest possible manner, and neglect should be visited with serious penalties.

The above figures would be more strikingly in favour of my argument but for the fact that I was instrumental in having the following order published in the 19th Division Routine Orders on Feb. 3rd, 1916:—

*D.R.O. 107. 3rd February, 1916. Discipline.*

A large amount of the sickness in the Division is due to the fact that the cleanliness of the teeth is very largely neglected, resulting in such ailments as dyspepsia, gastritis, rheumatism, general debility, and even symptoms resembling influenza. Commanding officers, and more especially company officers, should see that every man is in possession of a tooth-brush and that this is used for its legitimate purpose, and C.O's. i/c units should impress upon all concerned the importance of the hygiene of the mouth.

I am, Sir, yours faithfully,

G. J. STONEY ARCHER,
Lieutenant-Colonel, R.A.M.C.

## WALKER-GORDON LABORATORIES: A TEMPORARY SUSPENSION OF WORK.

*To the Editor of* THE LANCET.

SIR,—Will you permit us to inform the members of the medical profession that owing to the conditions now existing we find it no longer possible to carry out the methods and arrangements which constitute the essence of this business, and we are obliged, therefore, with the greatest regret, to close down until the termination of the war.

We are, Sir, yours faithfully,

WALKER-GORDON LABORATORIES, LIMITED.

Weymouth-street, July 31st, 1916.

SOCIETY FOR THE STATE REGISTRATION OF TRAINED NURSES.—At the last meeting of the executive committee of this society Mrs. Bedford Fenwick, the President, proposed a motion recording "the profound sorrow of the society at the irreparable loss sustained by the death on active service in Mesopotamia of its distinguished Vice-President, Colonel Sir Victor Horsley, C.B., F.R.C.S., F.R.S., LL.D." The motion was carried in silence, the members standing.

DONATIONS AND BEQUESTS.—By the will of the late Mr. J. Plews the Merthyr Tydfil General Hospital will receive £500.—The late Mr. Salomon Stern has bequeathed £500 to the London Hospital, King Edward's Hospital Fund.—Under the will of the late Sir Michael Barker Nairn, Bart., bequests of £6000 have been left to the Kirkcaldy Hospital, £2000 equally between the Cupar Victoria Nursing Association, the Ladybank Victoria Nursing Association, the Letham Nursing Association, and the assistance of nursing in the villages of Springfield and Pitlessie; £1000 to the Dysart Victoria Nurses Endowment Fund; £2500 for the endowment fund of Kirkcaldy Victoria Nurses; and £500 to the Cupar Cottage Hospital for the endowment fund.—Subject to her sister's life interest the late Miss Mary Hadley, of Smethwick, has bequeathed £500 each to the General Hospital, Birmingham; the Queen's Hospital, Birmingham; the Birmingham and Midland Free Hospital for Sick Children; the Birmingham and Midland Hospital for Women; the Birmingham and Midland Eye Hospital; the Birmingham Lying-in Charity; the Birmingham and Midland Ear and Throat Hospital; the Midland Counties Home for Incurables, Leamington; and the Society for the Prevention of Cruelty to Children; and £800 each to the Institute for the Deaf and Dumb Children, Birmingham, and the General Institute for the Blind, Birmingham.

# The War.

## THE CASUALTY LIST.

THE following names of medical officers appear among the casualties announced since our last issue :—

*Killed.*

Captain A. M. Thomson, R.A.M.C., attached to the Royal Sussex Regiment, was educated at the Royal University, Belfast, qualifying in 1909. He was in practice at Belfast prior to joining the R.A.M.C., shortly after the outbreak of war.

*Died.*

Lieutenant-Colonel A. H. Lister, C.M.G., R.A.M.C., 19th General Hospital, Alexandria, was educated at Marlborough and Cambridge, and qualified at Aberdeen University. He was a specialist in tuberculosis, practising in Aberdeen, in which city he held many appointments.

Captain H. R. Robertson, R.A.M.C., attached to the Essex Yeomanry, graduated M.D. Dublin in 1895, and was in practice at Tientsin, China, for some years. He joined the R.A.M.C. soon after the outbreak of war.

Captain W. Hillbrook, British East African Expeditionary Force, was educated at Cambridge and at St. George's Hospital, London, and qualified in 1915. He proceeded to Uganda, taking a post at the Mengo Hospital, and subsequently accepted a commission in the Expeditionary Force.

*Wounded.*

Captain J. M. Stenhouse, R.A.M.C., attached to the Royal Field Artillery.
Captain J. Granger, South African Medical Corps.
Captain S. Liebson, South African Medical Corps.
Captain T. Sheehan, R.A.M.C.
Captain J. D. Wilkinson, R.A.M.C., attached to the Royal Field Artillery.
Captain W. J. Henry, R.A.M.C., attached to the Wilts Regiment.
Captain A. T. Nankivell, R.A.M.C., attached to the Argyll and Sutherland Highlanders.
Lieutenant E. F. Nivin, R.A.M.C.
Captain W. D. Chambers, R.A.M.C., attached to the Gloucester Regiment.
Captain A. Grant, R.A.M.C., attached to the Royal Fusiliers.
Lieutenant H. B. Maxwell, R.A.M.C., attached to the London Regiment.
Captain A. F. Palmer, R.A.M.C., attached to the Royal Field Artillery.
Lieutenant A. L. Anderson, R.A.M.C., attached to the Royal Warwick Regiment.
Captain R. Lawson, R.A.M.C.
Captain R. H. Lucas, R.A.M.C., attached to the Royal Fusiliers.
Captain J. A. Macleod, R.A.M.C.
Captain J. H. H. Pearson, R.A.M.C., attached to the Royal Lancaster Regiment.
Captain D. Pottinger, R.A.M.C.
Captain S. Brown, R.A.M.C., attached to to the Royal Field Artillery.
Captain H. E. O'Brien, R.A.M.C.
Captain R. Park, R.A.M.C., attached to the Royal Field Artillery.

*Previously reported Believed to have been taken Prisoners at Kut-el-Amara, now reported Prisoners.*

Captain L. A. P. Anderson, I.M.S.
Major C. H. Barber, I.M.S.
Colonel P. Hehir, C.B., I.M.S.
Captain H. H. King, I.M.S.

*Believed taken Prisoner at Kut-el-Amara.*

Major S. Bose, I.M.S.

## DEATHS AMONG THE SONS OF MEDICAL MEN.

The following sons of medical men must be added to our lists of those who have fallen during the war :—

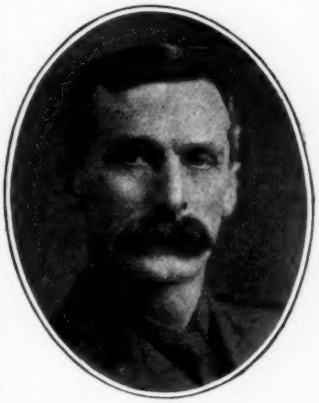
Second Lieutenant M. Heyward, Dorset Regiment, son of Dr. H. Heyward, of Croydon.
Private H. D. Johnson, Somerset Light Infantry, third son of the late Dr. P. P. Johnson, of Yatton, Somerset.
Lieutenant W. Hall, South Staffordshire Regiment, son of Dr. W. Hall, of Hodnet, Salop.
Lieutenant J. L. Whitty, Leinster Regiment, attached to the Royal Flying Corps, third son of Lieutenant-Colonel M. J. Whitty, R.A.M.C.
Second Lieutenant A. J. Bullivant, Sherwood Foresters, younger son of the late Dr. S. Bullivant, of Mansfield, Notts.
Second Lieutenant A. G. Chambers, Middlesex Regiment, fourth son of the late Dr. A. B. Chambers, of Long Eaton, Notts.
Second Lieutenant W. K. Sanderson, Border Regiment, only surviving son of the late Dr. T. D. Sanderson, of Fairfield, Penrith.
Captain W. T. V. Gripper, East Surrey Regiment, eldest son of Dr. W. Gripper, of Wallington, Surrey.
Lieutenant and Assistant Adjutant H. B. Murray, Argyll and Sutherland Highlanders, fifth son of the late Dr. W. B. Murray, of Tenbury, Worcestershire.
Lieutenant H. B. Fisher, Northumberland Fusiliers, younger son of Dr. G. E. Fisher, of Skipton, Yorks.
Captain J. A. Ritson, South Lancashire Regiment, only child of Major R. Ritson, R.A.M.C., of Reading.
Captain G. B. Donaldson, Royal Warwickshire Regiment, only child of the late Dr. E. Donaldson, of Londonderry.
Captain W. F. G. Willes, Dorsetshire Regiment, eldest son of Mr. W. Willes, M.R.C.S., &c., of Bournemouth.
Second Lieutenant C. O'C. McSwiny, King's Shropshire Light Infantry, younger son of Dr. M. O'C. Swiny, of Okehampton, Devon.
Second Lieutenant E. R. Ratcliff-Gaylard, Duke of Cornwall's Light Infantry, only surviving son of Dr. J. Ratcliff-Gaylard, of Birkenhead.
Second Lieutenant N. Compton-Burnett, Leicestershire Regiment, son of the late Dr. J. Compton-Burnett, of Finsbury, London.
Lieutenant and Adjutant N. C. Clery, Royal Field Artillery, younger son of Surgeon-General Clery, C.B., of Blackheath, Surrey.
Lieutenant C. P. Cæsar, Shropshire Light Infantry, son of the late Dr. C. A. Cæsar, of Hatfield, Herts.
Lieutenant A. C. Holland, Bedfordshire Regiment, youngest son of Dr. J. F. R. Holland, H.B.M. Consul, St. Moritz, Switzerland.
Captain W. V. T. Gripper, East Surrey Regiment, eldest son of Dr. W. Gripper, Wallington, Surrey.
Lieutenant A. W. Sewill, West Yorks Regiment, elder twin son of Mr. H. E. Sewill, M.R.C.S., &c., of Earlswood Common, Redhill, Surrey.

## OBITUARY OF THE WAR.

### ARTHUR HUGH LISTER, B.A. CAMB., M.D., C.M. ABERD.,

LIEUTENANT-COLONEL, ROYAL ARMY MEDICAL CORPS.

Lieutenant-Colonel A. H. Lister, who died on July 17th at the age of 51, was the son of the late Arthur Lister, F.R.S., and a nephew of the late Lord Lister. He was educated at Marlborough and Trinity College, Cambridge, and graduated in medicine at Aberdeen University in 1895, taking his M.D. degree with honours in 1904. After a period of post-graduate study in London, during which he was house physician at the Middlesex Hospital, he settled in Aberdeen, where, in addition to the claims of a considerable consulting practice, he filled with distinction a number of important posts. He was at various times honorary physician to the tuberculosis wards at the Aberdeen City Hospital, medical officer to the Morningfield Hospital for Incurables, and honorary medical referee to the Newhills Sanatorium. His chief work, however, was at the Aberdeen Royal Infirmary, to which he was attached for many years, being at the time of his death full physician and lecturer on clinical medicine at Aberdeen University. In the latter capacity his power and lucidity as a teacher were much appreciated by the



students. Shortly after the outbreak of war he went to France to take charge of the medical side of the hospital unit at Wimereux, and later, in April, 1915, he was given the medical charge of the 19th General Hospital at Alexandria, where he devoted himself to the duties of his position with characteristic energy and enthusiasm. In recognition of his services he obtained a short time before his death the distinction of C.M.G. The strain of a second summer's work under the trying conditions of Alexandria proved too much for his health and led to the recurrence of an old pulmonary tuberculous lesion, for which he had undergone a long course of treatment with satisfactory result a few years previously. The disease made rapid progress and he died at sea while on the voyage home.

One of his contemporaries writes of him: "Lister was a physician of unusual ability, a good teacher, and a man of singular charm and nobility of character. To his patients he was as much friend as physician. He regarded his life and energy as a trust to be spent, heedless of himself, in the interests of others, and to the strain involved in his untiring devotion to this ideal is largely to be attributed his premature death." The truth of this verdict will be recognised by all who knew Colonel Lister. His loss leaves the medical profession the poorer and a gap hard to fill in the wide circle of his friends. Colonel Lister married in 1896 Sybil, daughter of the late Sir Reginald Palgrave, K.C.B., Clerk to the House of Commons, who survives him, with a family of seven children.

## EDWARD AUGUSTINE BELL, M.B., B.S. LOND.,

CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain E. A. Bell, who was accidentally drowned whilst on active service in France on July 11th at the age of 38, was the fourth son of the late William Bell, M.R.C.S., J.P., of New Brighton, Cheshire. He was educated at Rossall and Birkenhead Schools. Entering King's College, London, with a scholarship, he gained both junior and senior scholarships, the Tanner prize for obstetrics, and was prosector at the Royal College of Surgeons. Captain Bell qualified M.R.C.S. Eng. in 1902, taking the M.B. Lond. in the same year and the B.S. in 1903. After holding the post of house surgeon at the Royal Free Hospital he settled in New Brighton as assistant, and subsequently partner, to his father, Mr. William Bell, at whose death in April, 1915, he succeeded to the whole practice. He was honorary senior surgeon to the Wallasey Cottage Hospital, honorary surgeon to the New Brighton Convalescent Home and Wallasey Ladies' Charity, surgeon to the Home for Aged Mariners, Egremont, as well as Admiralty surgeon and agent. In November, 1915, he was appointed surgeon to the British Hospital at Wimereux, and later was attached as surgeon specialist to the Anglo-American Hospital, where he remained until his death. On June 18th he was gazetted as temporary Honorary Captain in the Royal Army Medical Corps.

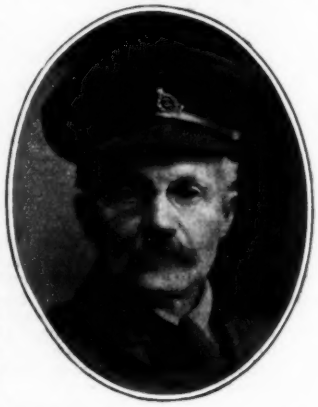
One of his colleagues in France writes of him: "Bell worked for the patients day and night and was loved by them all. He did 46 operations the day before he died and was quite exhausted by it. His was a fine nature, strong and true and capable, tender and untiring with the men, loyal to all our interests. He died in the midst of his work and at the height of his usefulness."

In his leisure time Captain Bell was a keen athlete, playing for his hospital in the inter-hospital cup-ties, and as a tennis player represented Cheshire and won prizes in many open tournaments. He married in 1904 the younger daughter of Canon Cogswell, D.D., rector of Wallasey, and leaves a widow and two children.

## ROBERT WILLIAMS MICHELL, M.A., M.D., B.C.CANTAB., F.R.C.S. ENG.,

CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain R. W. Michell, who died in London on July 19th from wounds received in action in France at the age of 56 years, was the eldest son of Mr. R. F. Michell, of Truro, and came of an old Cornish family. His medical education was begun at Cambridge and continued at St. Bartholomew's Hospital. He was a devoted member of Caius, where he had captained the college boat, and graduated in medicine in the University, taking the F.R.C.S. Eng. a little later. Among the several appointments he held was a demonstratorship in anatomy in the University, and the experience thus gained served him in good stead. He remained in Cambridge, where his practice was chiefly among the undergraduates and younger graduates of the University. His keenness and energy, with enthusiasm for the young life of the University, his desire to do his best, and give the most valuable of his great store of experience to those who needed it among active under-graduates, was a striking characteristic of the man. He entered into the conditions liable to arise from undue exercise, with care, skill, and a knowledge that was considerable and of the greatest value. Heart strain was one of the conditions he particularly laboured to understand, so that he might guide aright the natural bent of the keen sporting man. In this subject he had already won the distinction of being an authority of no mean order. He was one of the first practitioners to make use of the electro-cardiograph as a regular routine in his clinical studies and practice.



Sir Clifford Allbutt writes of him: "Michell was so impressed by the complexity and obscurity of cardiac problems that it was difficult to persuade him to publish any of his researches, and I fear for the same reason that we shall find little left for publication. For Allbutt and Rolleston's 'System of Medicine' Michell had contributed a few short paragraphs, and I know he had collected some further notes for a separate edition of my article in that System which probably now will not see the light. Nevertheless, in one way or another Michell's researches on cardiac disorders became well known both to the profession and to the public, so that his opinion was sought in many responsible cases. Sometimes he attended scientific discussions on cardiac questions, but the loose general statements which too often find their way into such conversations made him angry. Likewise he was liable to be moved to wrath if on one of his cases another opinion were given on half the consideration and often on less experience than he had given to it. On such occasions, like Lawrence Boythorne, he would express himself with as much vigour and point and with as little malice."

Another friend writes of him: "Apart from his medical labours, it may truly be said that no one ever succeeded so much as Michell in winning the confidence of young men, in impressing upon them the genuineness of his advice, and of the solicitude he ever exercised for the benefit of others."

Captain Michell served in the Boer War, and as soon as the present war broke out he was keen to serve and do his share. No one can forget the series of brave acts which he performed just before he was himself wounded; and for these he has been recommended for the Victoria Cross. He leaves a widow and a boy of eight.

LIFE-SAVING MEDALS OF THE ORDER OF ST. JOHN.—At a recent chapter-general of the Order of St. John gold life-saving medals were presented to Major Harold Edgar Priestley, C.M.G., R.A.M.C., and Captain Alan Cunliffe Vidal, D.S.O., R.A.M.C., in recognition of the gallantry displayed by them at the Wittenberg Camp. Captain James La Fayette Lauder, D.S.O., R.A.M.C., was prevented by military duties abroad from attending to receive a similar medal.

## THE HONOURS LIST.

The King has conferred the honours mentioned upon the following medical officers in recognition of their gallantry and devotion to duty in the field :—

*Distinguished Service Order.*

Temporary Captain W. Dawson, R.A.M.C.

For conspicuous gallantry and devotion to duty when dressing the wounded and directing stretcher-bearers in the firing line. At dusk he searched the front himself under heavy rifle fire till every wounded man had been removed.

Captain P. F. Gow, I.M.S.

For conspicuous gallantry and devotion to duty on several occasions, notably when he took one end of a stretcher after three bearers had been hit, and brought in a wounded officer.

Captain W. A. Miller, R.A.M.C., Special Reserve, attached 22nd (S.) Battalion, Royal Fusiliers.

For conspicuous gallantry and devotion to duty. Captain Miller followed the front line of our attack over ground swept by shell, machine gun, and rifle fire. He searched in every direction for wounded, and gained valuable information regarding the situation. This he at once communicated and again continued his search for wounded. This officer has on previous occasions shown distinguished gallantry.

Temporary Lieutenant L. M. Rowlette, R.A.M.C., attached 1st Battalion Welsh Guards.

For conspicuous gallantry and devotion to duty. During a heavy bombardment he crawled across the open for a considerable distance to attend to two wounded men. Later he went out again and, although twice wounded, dressed the wounds of seven wounded men and tended them till he had to be himself removed.

*Military Cross.*

Temporary Captain N. Black, R.A.M.C., attached 11th Battalion Argyll and Sutherland Highlanders.

For conspicuous gallantry and devotion to duty. After a shell had blown in his dressing station and he had been cut, bruised, and much shaken, he rested ten minutes and then, although still suffering, went out under heavy fire to attend to a wounded officer in the support trenches.

Temporary Captain C. M. Brophy, R.A.M.C., attached 18th Battalion London Regiment (T.F.).

For conspicuous gallantry in leading bearer squads under heavy shell-fire. To succour wounded he maintained communication with the regimental aid-posts, and so enabled a large number of wounded to be rapidly brought back.

Captain J. A. Cullum, Canadian A.M.C., attached 28th Canadian Infantry Battalion.

For conspicuous gallantry. During a very heavy bombardment by the enemy he saw a sergeant buried in his dug-out by a direct hit. He at once went out and at great personal risk succeeded in rescuing the sergeant and taking him to the dressing station. On many previous occasions he had displayed great coolness under fire.

Captain H. E. Cumming, No. 4 Field Ambulance, Canadian A.M.C.

For conspicuous gallantry and devotion to duty when carrying out his duties during the heavy bombardment of a battery of artillery by the enemy.

Captain H. F. L. Hugo, R.A.M.C. (T.F.), attached Royal 1st Devon Yeomanry.

For conspicuous gallantry, notably when he went to the front-line trench under heavy shell-fire, and, after his orderly had been dangerously wounded and half buried, stood by and supported him till help arrived. Two officers and two men were killed within a few yards of him. On another occasion he brought in a wounded lieutenant across 200 yards of open ground under sniping fire.

Captain A. E. Ironside, 4th London Field Ambulance, R.A.M.C. (T.F.).

For conspicuous gallantry and devotion to duty when in charge of bearer subdivisions. He organised the work most efficiently, and assisted in the dressing of wounded under heavy shell-fire.

Temporary Captain F. P. Joscelyne, R.A.M.C., attached 2nd Battalion, Royal Sussex Regiment.

For consistent gallantry and devotion to duty. He has shown complete disregard of personal danger on all occasions, and has frequently carried out his duties under heavy fire. On one occasion a bullet from a machine-gun passed through his coat, but he showed complete indifference.

Captain N. L. Joynt, R.A.M.C., Special Reserve, attached 176th Tunnelling Company, R.E.

For conspicuous gallantry. When the enemy exploded a camouflet which choked a mine gallery with foul gas, he at once organised rescue work, going down himself repeatedly with rescue apparatus. Through his cool bravery he succeeded in personally rescuing two men and ensured the quick recovery of others.

Captain R. L. Lloyd, South African Medical Corps.

For conspicuous gallantry and devotion to duty when tending the wounded under machine-gun fire.

Temporary Captain J. M. MacKenzie, R.A.M.C., attached 6th Battalion Northumberland Fusiliers (T.F.).

For conspicuous gallantry and devotion to duty. Though wounded in the foot and arm he refused to go to hospital, and four days later, during a heavy hostile bombardment, he went up through the enemy artillery barrage and tended many wounded men, though in considerable pain himself.

Captain W. H. Riddell, I.M.S.

For conspicuous gallantry and devotion to duty on several occasions when tending the wounded under heavy fire.

Captain R. A. Stewart, R.A.M.C., Special Reserve, attached 2nd Battalion Border Regiment.

For conspicuous gallantry. During the attack on an enemy position he went forward and established an aid-post in a mine crater, and tended many wounded under heavy shell-fire. His coolness and disregard of personal safety gave great confidence to those round him.

Captain G. W. Treleaven, Canadian Army Medical Corps.

For conspicuous gallantry and devotion to duty when attending wounded men under heavy shell-fire, and getting them into safety.

Temporary Lieutenant J. R. Irwin, R.A.M.C., attached 2nd Battalion, Worcestershire Regiment.

For conspicuous gallantry. When the enemy exploded a mine, damaging our galleries, he immediately descended into the gallery and at great risk, owing to foul fumes, treated a man and enabled him to be brought up alive.

Temporary Lieutenant C. C. Okell, No. 6 Field Ambulance, R.A.M.C.

For gallant conduct in frequently leading a bearer division over shell-swept ground. His bravery and good example greatly assisted in the removal of all our wounded.

Temporary Lieutenant Peter Mortimer Turnbull, R.A.M.C., attached 2nd Battalion, Royal West Surrey Regiment.

For conspicuous gallantry when tending the wounded under heavy fire on several successive days.

With regard to the following, the specific acts for which the Military Cross has been granted will be officially announced later :—

Temporary Captain H. A. Pallant, R.A.M.C., attached 1st Battalion North Lancashire Regiment.

Temporary Lieutenant F. R. Hassard, R.A.M.C., 102nd Field Ambulance.

Temporary Lieutenant V. F. Stock, R.A.M.C., 104th Field Ambulance.

Temporary Lieutenant G. B. Wiswell, R.A.M.C., 103rd Field Ambulance.

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## THE NEED FOR OFFICERS IN THE ROYAL ARMY MEDICAL CORPS.

At the annual Representative Meeting of the British Medical Association, reference was made by Dr. T. Jenner Verrall, chairman of the Central Medical War Committee, to a strong feeling that had been expressed in certain quarters on the subject of the withdrawal by the War Office of the privilege of resigning commissions in the Royal Army Medical Corps after 12 months' service. Dr. Verrall stated that the matter had been taken up with the War Office very thoroughly at the first moment when the idea had been mooted of any such alteration being made in the terms of service, and the following communication on the subject was made to the meeting in the form of a letter from Sir Alfred Keogh to Dr. Verrall :—

July 29th, 1916.

DEAR DR. VERRALL,—From certain things that have come to my knowledge, I think that a considerable amount of misunderstanding must be prevalent in regard to the temporary order recently issued concerning the privilege accorded to doctors early in this war of resigning their commissions after 12 months' service.

All that has been done in this connexion is that a communication was sent a few weeks ago to certain commands instructing them that, for the present, any doctors (under 41 years of age) whose 12 months' term was shortly expiring, and who desired to resign at the end of it, were to be informed that the date of resigning must, in the present serious stress, be postponed for a time until the number of doctors available for taking R.A.M.C. commissions should have been increased to a figure more nearly meeting our very grave requirements.

The step was taken, I need hardly say, with the very greatest reluctance, but it was imperative by reason of our knowledge of the very heavy needs of the forces, as now visible to everyone, in the recent and present military developments at the Somme ; and it was due to those heavily increased needs, taken in conjunction with the unfortunately inadequate number of doctors forthcoming for commissions in the R.A.M.C. during the important months of April, May, and June.

And, lastly, it was a strictly temporary order, to be rescinded the moment the number of doctors produced by your Committee becomes sufficient to justify this.

In particular, it should be noted that the step thus taken affected, and affects, not the whole profession who enrol (as has been alleged) but only a very small number of doctors. I should tell you, by the way, that the vast majority (over 90 per cent. I believe) of the doctors who have taken commissions in the Royal Army Medical Corps since

the privilege of 12 months' service was accorded, have exercised their option in the direction of staying on in the service, and not resigning at the end of their year.

And the order affects only those of the men holding commissions at the time it was issued whose year happened to be shortly expiring and who were not proposing to stay on. Furthermore, it was restricted to such of that limited number as came within the compulsory provisions of the Military Service Acts, the passing of which has, of course, fundamentally altered the position of all the men under 41 as compared with what it was when they were given their Royal Army Medical Corps commissions in July, 1915.

Thus you see the number of doctors affected (and this only temporarily) is extremely small. In particular, it must be noted (in view of the misapprehensions so widely circulated) that doctors who have taken commissions at any time during this year or the latter part of last year are in no way affected by the order. All these men have come in with their option of resigning unaltered; and, if the number of doctors forthcoming in future is sufficient for our needs, there is no reason to suppose that the option in their cases will ever be altered or need to be withdrawn.

There is, therefore, no such "breach of faith" towards the whole profession (and in particular towards the 260 men recently called to commissions) as has been alleged in certain quarters. There has been simply a strictly temporary administrative step taken, in relation to a very limited number of medical men (each of them liable now to compulsory service), under compelling military necessities of the first importance for this country, a temporary change which will be rescinded the moment the overmastering needs of the situation have been adequately provided for—in fact, I hope in a very few weeks' time—a step, therefore, in which, when it is properly understood, the whole profession and the public and Parliament will, I am certain, concur; so much so that, I am sure, had we failed to take it, in the circumstances we should have been considered guilty of a grave dereliction of public duty; and the profession, had it failed to respond, of a lack of public spirit of which I, for one, do not believe it to be capable.

I write you this letter because I thought it would be well if you would take the opportunity of your annual meeting this week to make this whole matter clear and to dissipate the prevailing misapprehensions on the subject.

I am, yours very truly,
A. KEOGH.

## FEES FOR EXAMINING RECRUITS.

We have received from Dr. A. G. Bateman, the general secretary of the Medical Defence Union, a copy of a letter addressed to him from the War Office, which satisfactorily terminates a correspondence of some duration, respecting the claims of medical practitioners on account of fees for medical inspection of recruits in certain districts. These claims were disputed owing to the failure of a memorandum issued by the War Office in February, 1915, limiting payment to an amount below the usual scale of peace-time, to reach some recruiting centres in time. The letter is as follows:—

War Office, London, S.W., 29th July, 1916.

SIR,—With reference to previous correspondence on the subject of claims of medical practitioners for the examination of recruits, I am directed to acquaint you that it has now been decided to settle the disputed claims referred to by the payment of 2*s.* 6*d.* a head up to 16 recruits examined and 2*s.* for each recruit examined in excess of 16 in any one day. I am to express the hope that this arrangement may be found satisfactory.

I am, Sir, your obedient servant,
(Signed) R. PATERSON.
(For the Assistant Financial Secretary.)

Dr. A. G. Bateman, General Secretary,
Medical Defence Union, 4, Trafalgar-square, W.C.

## USE OF MORPHIA FOR WOUNDED MEN IN THE FIELD.

The administration of an opiate to the wounded man pending surgical treatment has long been recognised as a legitimate practice. Erichsen, in his "Science and Art of Surgery" (tenth edition, vol. ii.), recommended that shock and pain should be counteracted by a little brandy-and-water and opium, and plenty of cold water to relieve thirst. Sir Thomas Longmore considered that morphia (especially in hypodermic injection) might be used with much advantage ("Gunshot Injuries," 1877), the value of the remedy consisting not merely in the reduction of local pain and in soothing spasm, but principally in its influence over the mental irritation and constitutional disturbance which result from them. On the other hand, no mention of morphia is made by Surgeon-General Stevenson ("Wounds in War," third edition), who recommends hypodermic injection of strychnia for shock, together with the administration of food and stimulants, such as meat extract and a little alcohol. In the "Manual of Training" for the use of the Royal Army Medical Corps it is clearly stated that during an engagement the immediate treatment of wounded by the regimental medical detachments includes, *inter alia*, the relief of pain, for which a hypodermic tabloid of morphia may be placed under the tongue. It is, however, laid down that opiates should only be used under the orders of a medical officer. The tablets formerly contained one-sixth of a grain of hydrochloride of morphia; they now contain, we believe, one-quarter of a grain of morphine tartrate. The liability to abuse is obvious, but we are inclined to the belief that the risk of its occurrence is not great, and that the benefit resulting from immediate alleviation of suffering by a small dose of morphia placed under the tongue, as suggested, would outweigh the hypothetical disadvantages. The magnitude of the operations in the present conflict, the enormous numbers engaged, and the time that must inevitably elapse in many cases before a medical officer can attend personally to the wounded man, combine to suggest some relaxation of the wholesome rule restricting the use of morphia. Doubtless this already occurs in practice. We have learned that the private soldier can be trusted to a greater extent than would have been thought advisable 20, or even 10, years ago.

THE EDUCATIONAL BOOK SCHEME AND BRITISH PRISONERS OF WAR.—The recent revelations respecting the condition and needs, physical and mental, of some of the British prisoners of war interned abroad, coupled with the recently imposed restrictions on the transmission, by private individuals, of any printed matter to enemy or neutral countries, make it more important than ever that friends and correspondents of our interned men when writing to them should acquaint them with the existence of the Educational Book Scheme. Under this scheme a prisoner can obtain, free of charge and carriage paid, good books of an educational character (not fiction or light literature) on almost any subject for reading or private study during his internment by communicating (either directly or through a correspondent) with Mr. A. T. Davies, of the Board of Education, Whitehall, London, S.W. Prisoners are invited to state as precisely as possible on a form (which can be had gratis on application) what kind of books they desire. Offers of suitable books for the Educational Book Scheme will be gladly received by Mr. Davies, but they should be accompanied by a submission of the list of books proposed to be contributed.

# Medical News.

EXAMINING BOARD OF THE ROYAL COLLEGES OF PHYSICIANS AND SURGEONS OF EDINBURGH AND ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—The following are the results of the Triple Qualification Examinations:—

FIRST EXAMINATION.

William Barton, William Campbell, Ronald Gillan Clouston, Jessie Hayne Crawford, Ian Bruce Cummings, David Falconer Smith, and Jessie Melville Lyell Wright.

SECOND EXAMINATION.

Apcar Galustian, Stuart Douglas M'Ausland, Gordon Patrick Walker, and Alexander Watson, L.D.S.

THIRD EXAMINATION.

Samuel Saxon Barton, George Carter Cossar, M.A. (with distinction), William Hutchison Duff, Robert Lloyd Jones, William Ulic Desmond Longford, Archibald Buchanan MacDougall, L.D.S., Allan Paul M'Leod, Cuthbert Gaulter Magee, Patrick Aloysius O'Brien, Archibald Paterson Robb, Thomas Talmage Road, L.D.S. (with distinction), and Thomas Robert Wilson.

FINAL EXAMINATION (L.R.C.P. & S. EDIN., L.R.F.P. & S. GLASG.).

Richard Lloyd Jones, William Bruce Lawson, L.D.S., Michael Campbell, Keki Sorabji Bhiwandiwalla, Maniketh Vythi Menon, William Campbell Borrie, John Alexander Murray, John Alexander Smith, James Young M'Lean, Percy Hayes, and John Bygott.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—A Comitia was held on July 27th, Dr. Percy Kidd, the Senior Censor, being in the chair. The following candidates having passed the required examination were admitted Members of the College: Richard Alun Rowlands, M.B.

Lond., L.R.C.P., and Gilbert Innes Strachan, M.D. Glasg. (Cardiff). Licences to practise physic were granted to 120 candidates who had passed the requisite examinations. In conjunction with the Royal College of Surgeons of England Diplomas in Public Health were granted to Reginald St. George Smalbridge Bond, M.B., C.M., F.R.C.S. Edin., Ethel Mary Minett, M.B., B.S. Lond., and Henry Owen West, M.D., B.S. Lond., M.R.C.P. Lond. On the nomination of the President, the Council, and the Library Committee the following elections were made:—

*Censors.*—Dr. W. Hale White, Dr. W. Pasteur, Dr. S. H. C. Martin, and Dr. H. W. G. Mackenzie.
*Treasurer.*—Sir Dyce Duckworth.
*Emeritus Registrar.*—Dr. E. Liveing.
*Registrar.*—Dr. J. A. Ormerod.
*Harveian Librarian.*—Dr. Norman Moore.
*Members of the Library Committee.*—Dr. G. N. Pitt, Dr. C. Ogle, Dr. T. H. A. Chaplin, and Dr. R. O. Moon.
*Curators of the Museum.*—Dr. J. Mitchell Bruce, Dr. Sir Seymour J. Sharkey, Dr. F. W. Andrewes, and Dr. W. Hunter.
*Finance Committee.*—Dr. S. P. Phillips, Dr. J. Taylor, and Dr. H. R. Spencer.
*Examiners.*—Chemistry: Mr. W. H. Hurtley and Mr. T. M. Lowry. Physics: Dr. F. Womack and Mr. A. W. Porter, F.R.S. Practical Pharmacy: Dr. H. J. Campbell, Dr. F. L. Golla, Dr. R. H. Miller, Dr. W. E. Dixon, F.R.S., and Dr. A. J. Clark. Physiology: Dr F. A. Bainbridge and Professor W. M. Bayliss, F.R.S. Anatomy: Mr. W. Wright. Medical Anatomy and Principles and Practice of Medicine: Dr. A. E. Garrod, Dr. F. W. Mott, Dr. A. G. Barrs, Dr. F. J. Wethered, Dr. F. J. Smith, Dr. H. G. Turney, Dr. J. Fawcett, Dr. A. M. Gossage, Dr. F. J. Poynton, and Sir John F. H. Broadbent. Midwifery and Diseases peculiar to Women: Dr. H. Williamson, Dr. C. H. J. Lockyer, Dr. T. G. Stevens, Dr. G. B. Smith, and Dr. J. B. Hellier.
*Public Health.*—Part I.: Dr. W. W. O. Beveridge, D.S.O. Part II.: Dr. S. A. M. Copeman.
*Tropical Medicine.*—Bacteriology: Dr J. C. G. Ledingham. Diseases and Hygiene of the Tropics: Dr. F. M. Sandwith.

The following communications were received: 1. From the Secretary of the Royal College of Surgeons of England, dated May 12th, June 9th, and July 14th, reporting proceedings of the Council of that College on May 11th, June 8th, and July 13th respectively. 2. From the Royal Society, dated June 19th, enclosing a copy of regulations for the organisation of a Conjoint Board of Scientific Societies adopted at a conference of representatives of the societies concerned and asking the College to nominate representatives upon the Board. The Acting-President nominated the President and Dr. Henry Head. An offer was received from Mrs. Streatfeild to give £10,000 in Consols to be held by the Royal College of Physicians of London and Royal College of Surgeons of England jointly in trust for the promotion of research. The offer was accepted and a letter ordered to be written to Mrs. Streatfeild thanking her for her generous gift. Dr. T. D. Acland was elected a Representative Governor of the University of Sheffield and Sir George Savage was reappointed a Representative on the Committee of Management of the Chelsea Physic Garden. Reports were received from the Committee of Management recommending that Rugby School be added to the list of institutions recognised by the Examining Board in England for instruction in Chemistry and Physics, and that the State University of Iowa, Iowa City, U.S.A., be added to the list of universities whose graduates in medicine are admissible to the Final Examination of the Conjoint Board. The reports were adopted. After some further formal business the Acting-President dissolved the Comitia.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—An ordinary meeting of the Council was held on July 27th, Sir Watson Cheyne, the President, being in the chair. In accordance with a report from the Court of Examiners it was resolved to issue Diplomas of Membership to 119 successful candidates. It was resolved to issue a Licence in Dental Surgery to a successful candidate. The secretary laid before the Council a balance-sheet and a statement of the receipts and expenditure of the Council. These were approved and adopted, and it was resolved to issue them with the annual report of the Council to the meeting of Fellows and Members and also in the calendar. A letter was read from the Assistant Secretary of the Local Government Board, forwarding by the direction of the President of the Board copies of the circular and regulations which the Board have issued with regard to the prevention and treatment of venereal diseases.

The Licence in Dental Surgery has been conferred upon Geoffrey Walter Allen, Guy's Hospital, who has passed the necessary examinations and complied with the by-laws.

CENTRAL MIDWIVES BOARD.—Special meetings of the Central Midwives Board were held at Caxton Hall, Westminster, on July 26th and 27th, with Sir Francis H. Champneys in the chair. A number of midwives were struck off the Roll, the following charges amongst others having been brought forward:—The midwife neglecting to take and record the pulse and temperature of the patient at each visit, as required by Rule E. 13; not keeping her register of cases as required by Rule E. 23. The midwife did not give to the Local Supervising Authority every reasonable facility for inspection of her register of cases, bag of appliances, and place of residence, nor for the investigation of her mode of practice, as required by Rule E. 24; she did not keep her bag and appliances in a satisfactory condition within the meaning of Rules E. 1 and 2. Having administered to the patient a drug other than a simple aperient the midwife failed to note the fact with the particulars thereof in her register of cases, as required by Rule E. 18; the child suffering from inflammation of, and discharge from, the eyes on the fifth day, and continuing so to suffer, she did not explain that the case was one in which the attendance of a registered medical practitioner was required, as prescribed by Rule E. 20 (5). The midwife not being scrupulously clean in every way, as required by Rule E. 1; when attending patients she did not wear a clean dress of washable material, as required by Rule E. 1. A child suffering from hæmorrhage of the cord, the midwife did not until 26 hours after the birth explain that the case was one in which the attendance of a registered medical practitioner was required, as prescribed by Rule E. 20 (5); when advising medical help as aforesaid she did not hand to the husband or the nearest relative or friend present the form of sending for medical help, properly filled up and signed by her, in order that this might be immediately forwarded to the medical practitioner, as required by Rule E. 19; she neglected to give to the registered medical practitioner who saw the child any information as to the hæmorrhage, and medical aid having been sought for the child as aforesaid she neglected to notify the Local Supervising Authority thereof, as required by Rule E. 21 (1) (a).

A letter was considered from the Sister of the Maternity Ward at the London Hospital inquiring whether attendance by a pupil midwife at a course of 15 lectures delivered by the obstetric physician and 13 delivered by the senior resident accoucheur would be deemed a compliance with Rule C. 1 (1) (c) requiring, *inter alia*, attendance at a course of not less than 20 lectures delivered by a registered medical practitioner recognised by the Board as a lecturer. The Board directed that the reply be that the Board is not prepared to adopt the suggestion of the Sister of the Maternity Ward of the London Hospital; according to Rule C. 1 (1) (c) the approved lecturer is bound to deliver not less than 20 lectures. Any additional instruction by another person would doubtless be advantageous.

MEMORIAL TO THE LATE LIEUTENANT-COLONEL EDSELL, R.A.M.C.—On Sunday last a mural memorial to the late Lieutenant-Colonel George Alfred Edsell, R.A.M.C., was unveiled by Canon Potter, vicar of St. Mark's Church, Surbiton. Lieutenant-Colonel Edsell had been in command of the 3rd Home Counties Field Ambulance, and died at his residence at Surbiton on August 15th, 1915, aged 56 years, after being invalided home on account of a severe attack of pneumonia. The tablet, which has been placed on the north wall of the church, was subscribed by his patients and friends in the Surbiton district.

# Parliamentary Intelligence.

## NOTES ON CURRENT TOPICS.

*Medical Arrangements in Mesopotamia.*

WHEN the Bill setting up Statutory Commissions to inquire into the conduct of the operations of war in the Dardanelles and in Mesopotamia was passing through the House of Commons several amendments were made in it. The House decided to add to the Dardanelles Commissioners Mr. W. Roch, M.P., and to the Mesopotamia Commissioners Commander J. C. Wedgwood, M.P., and also in each case a naval and a military officer.

On the motion of Mr. DILLON, an important provision was inserted in the clause dealing with the reports of the Commissions. It was to the effect that "the Commissioners appointed to inquire into the Mesopotamian campaign shall proceed with all possible expedition to inquire with regard to the provision for the sick and wounded, and shall report the results of their inquiry on this matter before proceeding with the rest of their inquiry." This provision was accepted without very much discussion, Mr. CHAMBERLAIN, the Secretary for India, intimating that the Government would accept it. He added that he believed that the provision dealt with the point on which the public most desired to have information and to have a report at the earliest possible time. He quite understood that the House did not wish the report on that subject to be delayed until the Mesopotamian Commission had finished the whole of its inquiries.

*Medical Men and Petrol.*

In the House of Commons on Tuesday, August 1st, Mr. HARCOURT made a statement as to the apportionment of petrol supplies by the Petrol Control Committee. He said that medical men would get the full amount of their application up to a maximum of 50 gallons per month. If any increase of petrol became available this 50 gallons maximum would be the first to have further consideration when special need could be shown.

## HOUSE OF COMMONS.

### WEDNESDAY, JULY 26TH.

*Deaths in Troop Train in India.*

Mr. W. ROCH asked the Secretary for India what regiments of Territorials took part in the journey by rail from Karachi to Peshawar, and the total number of deaths and of sickness.—Mr. CHAMBERLAIN replied: Drafts for several regiments aggregating over 1000 men were sent out together from this country, and I cannot at present give details. They will, no doubt, appear in the report which I am expecting from India. 136 cases of heat-stroke occurred, of which 19 have, according to the latest information in my possession, proved fatal.

Colonel YATE asked whether the senior officer from the Indian Army Headquarters and the specially selected medical officer deputed to investigate the case of the fatalities that occurred early in June in the troop train at Rohri and other places between Karachi and Lahore had been instructed to report as to who was responsible for the despatch of these troops up country at that time instead of retaining them in Karachi till the weather was suitable for travelling; and, if not, whether orders to that effect would now be issued.—Mr. CHAMBERLAIN answered: I have already given to the House all the information in my possession as to the mission confided to the two officers referred to in the question. I have also informed the House that I have instructed the Government of India that when they have ascertained the facts and fixed the responsibility for this disaster they are to hold the persons responsible to strict account. I have nothing material to add to these statements, but my honourable and gallant friend may be glad to know that I have asked the Government of India to report specifically on the following questions: Whether the loss of life was due to the route selected or to the lack of proper arrangements for the journey, or to both causes combined; and as regards the route chosen, whether it was urgently necessary to send the drafts by that route at once or whether the drafts could not have been taken to Bombay and detained in stations in the Deccan till the monsoon broke in Northern India.

Sir A. MARKHAM: Did the Government of India take any steps when this matter was mentioned in the House of Commons, and what was the reason why there should be delay in settling the responsibility?—Mr. CHAMBERLAIN: The Government of India instituted, I think, an inquiry as soon as the case came to their knowledge, and they informed me of this lamentable occurrence in a telegram, dated, I think, June 15th. In the same telegram they reported that they had instituted this inquiry and also that they are awaiting the result of that inquiry before fixing the responsibility.

### THURSDAY, JULY 27TH.

*Health of Troops at Salonica.*

Sir E. CORNWALL asked the Financial Secretary to the War Office whether the health of the British troops in Salonica and district was satisfactory; and whether, in view of the desire of their relatives and of the country generally for more information, he would arrange for the issue of occasional official bulletins with regard to these Forces.—Mr. FORSTER replied: Cases of enteric and dysentery have been very few, although there has been during the past three months some increase in the admissions to hospitals owing to the larger number of cases of malaria, diarrhœa, and pyrexia. The medical authorities, however, consider that on the whole the health of the troops is satisfactory. The issue of official bulletins must, of course, be dependent on there being anything to report. Such bulletins are, and will continue to be, issued when there is anything to say.

### MONDAY, JULY 31ST.

*Approved Societies and Venereal Disease.*

Mr. DENNISS asked the representative of the National Insurance Commissioners whether, in view of the report of the Royal Commission on Venereal Diseases that the rule by which Approved Societies were empowered to refuse sickness benefit to insured persons suffering from such disease was contrary to the interests of public health and national economy, and of the endorsement thereof by the British Medical Association and the conference of Industrial Assurance Approved Societies, and of the inestimable advantage to the race as well as to the individual arising from sufferers obtaining proper treatment in the primary stages of the disease, the National Insurance Commissioners would consider the advisability of recommending the Government to guarantee to the Approved Societies such deficiency in their funds as might result from the relaxation by them of the aforesaid rule.—Mr. C. ROBERTS answered: The rule disqualifying for benefit a member whose incapacity is due to his own misconduct is optional, and can be revoked by the society at its pleasure. The finance of the Insurance Act therefore must be held to include provision for the payment of benefit in such cases. The problem is, in fact, not wholly or mainly a financial one since the safeguarding of the benefit funds was not the object, so far as I am aware, which societies had in view in originally adopting rules of the kind in question. The whole question, to the vital importance of which the Insurance Commissioners are fully alive, is receiving careful consideration. I am hoping to have an early opportunity of consulting Approved Societies with regard to the position of the rules.

*Unregistered Dentists and the Supply of Cocaine.*

Mr. RAFFAN asked the Home Secretary whether the draft regulations designed to restrict the sale of cocaine which had been submitted to the Royal College of Physicians, as representing the medical profession, for their consideration had also been submitted to the British Dental Association, as representing registered dentists, and the Incorporated Dental Society, as representing unregistered practitioners in dentistry, who were equally interested in the matter.

Several other Members had questions on the notice paper dealing with the same subject.

Mr. H. SAMUEL (answering all these questions together) replied: The use of cocaine by registered dentists is not interfered with. As regards the persons who are referred to in the question as unregistered practitioners in dentistry, I am aware that there are a considerable number of persons who do dental work without being registered under the Dentists Act, but these persons are not possessed of the qualifications for the work which are required by that Act and are not entitled to take any step implying that they are specially qualified to practise dentistry. I have very carefully considered the position of these persons, but it would go a long way to nullify the Order and defeat the object which the Government have in view if any person who chooses to set up as an unregistered dentist were permitted to obtain and administer cocaine. I see no reason for thinking that any serious hardship will be caused by the prohibition to the unregistered dentists or their patients. There are other and less dangerous drugs which can be used for the same purpose.

Mr. HOGGE: Why cannot these unregistered men have the same quantity of cocaine as they have been using?—Mr. SAMUEL: For the reasons stated in my very full reply.

Mr. ANDERSON: Is the right honourable gentleman aware that this drug can be supplied in a solution in less than 1 per cent. under circumstances which will make its improper use impossible?—Mr. SAMUEL: We find it is necessary to have these stringent regulations in order that the very grave evil which is widely prevalent may be quickly suppressed.

Sir H. CRAIK: Is the right honourable gentleman not aware that these unregistered men constitute a very grave danger to the public and a great injury to the health of the community?

No answer was given.

Mr. RAFFAN: Will the right honourable gentleman give these men an opportunity of stating their whole case before he takes the drastic step of depriving them of the use of this drug?—Mr. SAMUEL: The regulation has already been made.

On the motion for the adjournment, Mr. RAFFAN drew attention to the prohibition of the sale of cocaine to unregistered dentists, to whom, he said, large portions of the community looked for dental treatment. The supply of registered dentists was not large enough for the needs of the population. It would cause pain and suffering to the patients of the unregistered men if they could not obtain cocaine for local anæsthetics for extractions. He was informed that no adequate supply of novocaine was available, as the Government had taken it. The honourable Member urged that a relaxation of the regulations on the sale of cocaine should be made in favour of the unregistered dentists.

Mr. SAMUEL in reply said: I do not think that the honourable gentleman is correct in saying that the regulation deprives any unregistered dentist of the right to administer local anæsthetics. It deals only with cocaine, and I am advised that among registered practitioners novocaine is used more than cocaine.

Mr. RAFFAN: They cannot get it.

Mr. SAMUEL: Novocaine is regarded as a safer and better means of applying a local anæsthetic, and it is anticipated that the regulation will stimulate the production of novocaine. If it is the case that novocaine is really unobtainable at the present time that is a new fact which has

not previously been brought to my notice, and it is a fact that I shall have to take into consideration. I am advised that the right course, if my honourable friend agrees, is to stimulate the use of novocaine rather than make exceptions in the regulations restricting the use of cocaine. I am informed on very good authority that the application of cocaine may be extremely dangerous in the hands of unskilled persons. There have been some fatal and a large number of non-fatal cases.

Mr. RAFFAN: They are among the registered dentists.—Mr. SAMUEL: No, unregistered dentists. I have had a number of specific cases mentioned to me within recent years of the death and serious poisoning due to unskilled use of cocaine, and it is regarded by many as being more dangerous in its application than ether. A certain number of men who practise dentistry without being registered are also chemists and druggists, and all these men can obtain cocaine for the purpose of their dental business because they are also chemists and druggists, and therefore free from the restrictions. Others, however, move about from place to place; they cannot be traced. A certain number of these men are of no very elevated character or remarkable skill or training, and it is considered that there would be very great administrative difficulties in trying to organise a scheme if we allowed the use of cocaine by these individuals for the very reason that they are not registered. It is suggested that many of them belong to organisations. I do not know that it would be practicable to give these organisations an official status and recognise the use of cocaine by all the members of these particular societies. Certainly we cannot allow any person who chooses to call himself an unregistered dentist to obtain a supply of cocaine as though he were a registered person in recognised practice.

Mr. CHANCELLOR: Can you issue licences under special conditions?—Mr. SAMUEL: It would be a very difficult thing, especially now when all officials are greatly overworked, to establish an entirely new class of unregistered dentist in which every case would have to be inquired into one by one. I have listened to what has been said as to the question whether there are sufficient supplies of novocaine, and to that aspect of the question I will certainly address myself.

Mr. RAFFAN: Will the right honourable gentleman not consider the question of giving a little time to these unregistered men? They might be ruined. At any rate, he might consider the suggestions put before him which would enable the possibility of bad treatment to be prevented entirely.—Mr. SAMUEL: I will do so. I will first see whether novocaine cannot be obtained quite freely.

*Royal Army Medical Corps Officers in Egypt.*

Sir H. CRAIK asked the Financial Secretary to the War Office whether doctors employed in Egypt for a year had been informed that they must remain for a longer period; and, if so, whether such doctors might be allowed to return to this country and to exercise their right of appeal to the professional committee.—Mr. FORSTER wrote in reply: Yes, sir. Temporarily commissioned Royal Army Medical Corps officers serving in Egypt, who would on ceasing to serve as doctors become subject to the provisions of the Military Service Act, have been retained beyond the termination of their year's contract. Their retention was necessary in order to provide adequately for medical requirements. It is hoped, however, that they may be able to return to this country at an early date when reliefs are available.

TUESDAY, AUGUST 1ST.

*Heat-stroke in Troop Train in India: Government Action.*

Major ASTOR asked the Secretary for India whether he had any further information about the troop train disaster in which a large number of soldiers suffered from heat-stroke.—Mr. CHAMBERLAIN replied: I will read a paraphrase of a telegram received from the Government of India.

We can now give a considered opinion having received report of Committee. The responsibility for diverting the ship from Bombay to Karachi rests with Brigadier-General Roe, who was acting as Quarter-master-General at the time. He knew unacclimatised troops had never before been sent in large numbers by rail in the middle of summer through the Sind Desert. He knew, or should have known, that the Commander-in-Chief in December, 1915, had decided that Karachi should not be used as a port at which wounded and sick British troops should be landed and distributed to other stations on account of danger of sending them in the hot season through Sind. It follows that before *Ballarat* was diverted to Karachi Acting Quarter-master-General should have consulted Commander-in-Chief, and he did not do this. Having taken on himself responsibility he should certainly have warned Karachi military authorities to take special precautions for safety of troops during journey by rail. He did not do this. We therefore must hold him responsible and propose to remove him from his appointment of Deputy Quartermaster-General.

It is clear from evidence that the mischief began before disembarkation, many men having been seen on deck bareheaded in the sun. All the officers on board were quite inexperienced, and we cannot therefore hold them blameworthy. The General Officer Commanding at Karachi was responsible for all arrangements for railway journey in his capacity as Embarkation Officer. It is shown from evidence that on the day concerned he was very busy, but he had ample warning of *Ballarat's* arrival. Though he knew responsible members of his staff, with one exception, were inexperienced, he took no steps nor gave any orders to see that the safety or comfort of the troops was provided for. In this we consider he failed in his duty, and we propose his removal.

Special blame we consider attaches to the Assistant Director of Medical Services at Karachi, an officer of long experience of the Indian Medical Service. In the circumstances it was undoubtedly his duty to see that every precaution suggested by medical science for the safety of the troops was taken. He failed, in our opinion, to do this. We therefore propose to remove him.

A number of omissions and errors on the part of other officers were committed, but these were due partly to inexperience and partly to adherence to regulations intending to govern only the ordinary trooping in cold weather. We do not propose to take any action in those cases. The only excuses that can be urged in favour of the officers who are, in our opinion, responsible are that many of the casualties were due to facts that in many cases the men left their carriages bareheaded and that the temperature during the journey was unusually high. Nevertheless, though these facts may have increased the number of casualties, we are clear that there can be no doubt that the train left Karachi insufficiently equipped, over-crowded, and without experienced officers either medical or combatant. We place for these reasons the responsibility on Brigadier-General Roe, on the General Officer Commanding, and on the Senior Medical Officer at Karachi. All that was possible seems to have been done by the local authorities beyond Karachi throughout the journey.

I should add (continued the right honourable gentleman) that I have expressed my concurrence with the course the Government of India have announced they intend to take with regard to the three officers. I am inquiring whether special instructions for the removal of troops during the hot weather have already been issued, and if not, suggesting that they should be issued at once, and I am communicating with the War Office at once in order that officers taking drafts out to India may be warned to take all precautions.

# Appointments.

*Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to* THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

BLUETT, D. C., has been appointed Resident House Surgeon at St. Thomas's Hospital.

CHARSLEY, R. S., M.R.C.S., L.R.C.P. Lond., Acting Assistant Surgeon to the Royal Westminster Ophthalmic Hospital.

HAMILTON, M. P. O., M.R.C.S., L.R.C.P. Lond., Casualty Officer and Resident Anæsthetist at St. Thomas's Hospital.

HARRIS, J. R., Resident House Physician at St. Thomas's Hospital.

HENSLEY, E. H. V., M.R.C.S., L.R.C.P. Lond., Casualty Officer and Resident Anæsthetist at St. Thomas's Hospital.

HYMAN, O. H., Resident House Physician and also House Surgeon and Resident Anæsthetist at St. Thomas's Hospital.

JOHNS, S. H. M., M.R.C.S., L.R.C.P. Lond., Resident House Surgeon at St. Thomas's Hospital.

MARRIOTT, W., Resident House Surgeon at St. Thomas's Hospital.

MAVROGORDATO, A., M.R.C.S., L.R.C.P. Lond., Resident House Physician at St. Thomas's Hospital.

RIVETT, LOUIS C., M.C. Cantab., F.R.C.S. Eng., Obstetric and Gynæcological Registrar and Tutor to the Middlesex Hospital.

SPROTT, N. A., M.B., B.Ch. Oxon., M.R.C.S., L.R.C.P. Lond., Casualty Officer and Resident Anæsthetist at St. Thomas's Hospital.

VEY, F. H., Resident House Surgeon at St. Thomas's Hospital.

WHITCOMBE, R. C. P., M.R.C.S., L.R.C.P. Lond., Casualty Officer and Resident Anæsthetist at St. Thomas's Hospital.

WILLS, A. G. P., B.A. Cantab., M.R.C.S., L.R.C.P. Lond., Casualty Officer and Resident Anæsthetist at St. Thomas's Hospital.

# Vacancies.

*For further information regarding each vacancy reference should be made to the advertisement (see Index).*

*When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.*

BEDFORD COUNTY HOSPITAL.—House Surgeon, unmarried. Salary as arranged, with board, &c.

BIRKENHEAD UNION INFIRMARY.—Female Resident Assistant Medical Officer. Salary at rate of £175 per annum, with board, &c.

BIRMINGHAM AND MIDLAND EYE HOSPITAL, Church-street.—Female Resident Surgeon. Salary £200 per annum, with board, &c.

BIRMINGHAM CITY.—Female Assistant Medical Officer for Infant Consultation work. Salary £300 per annum.

BIRMINGHAM CITY EDUCATION COMMITTEE.—Two Temporary Assistant School Medical Officers. Salary £300 per annum.

BOLTON INFIRMARY AND DISPENSARY.—Female Second House Surgeon. Salary £200 per annum, with board, &c.

BRISTOL ROYAL INFIRMARY.—House Surgeons and House Physicians. Salary at rate of £120 per annum, with board, &c. Also House Surgeon to Throat, Nose, and Ear Department.

BURY INFIRMARY.—Junior House Surgeon. Salary £150 per annum, with board, &c.

CARDIFF, KING EDWARD VII.'s HOSPITAL.—House Surgeon for six months. Salary at rate of £140 per annum, with board, &c.

CHARING CROSS HOSPITAL, W.C.—Resident Medical Officer. Salary at rate of £400 per annum, with board, &c.

CITY OF LONDON HOSPITAL FOR DISEASES OF THE CHEST, Victoria Park, E.—Resident Medical Officer. Salary at rate of £200 per annum, with board, &c.

COVENTRY AND WARWICKSHIRE HOSPITAL.—Senior House Surgeon. Salary £300 per annum, with board, &c.
DUNDEE ROYAL INFIRMARY.—Two House Surgeons.
GRIMSBY AND DISTRICT HOSPITAL.—House Surgeon. Salary £5 5s. per week, with board, &c.
GUILDFORD, ROYAL SURREY COUNTY HOSPITAL.—House Surgeon. Salary £150 per annum, with board, &c.
HOSPITAL OF ST. JOHN AND ST. ELIZABETH, 40, Grove End-road, N.W.—Resident Medical Officer, unmarried, for six months. Salary at rate of £250 per annum, with board, &c.
HUDDERSFIELD COUNTY BOROUGH.—Assistant School Medical Officer. Salary £300 per annum.
KING EDWARD VII.'S HOSPITAL FOR OFFICERS, 9, Grosvenor-gardens, S.W.—Resident Medical Officer.
LEEDS PUBLIC DISPENSARY.—Female Resident Medical Officer. Salary £200 per annum, with board, &c.
LINDSEY (LINCOLNSHIRE) COUNTY COUNCIL.—Locum Tenens Assistant Tuberculosis Officer for one month. Salary at rate of £400 per annum.
LIVERPOOL, DAVID LEWIS NORTHERN HOSPITAL.—House Surgeon for three or six months. Salary at rate of £150 per annum, with board, &c.
MAIDSTONE, WEST KENT GENERAL HOSPITAL.—Junior House Surgeon. Salary £150 per annum, with board, &c.
MANCHESTER CORPORATION.—Temporary Assistant Tuberculosis Officer. Salary at rate of £350 per annum.
MANCHESTER NORTHERN HOSPITAL FOR WOMEN AND CHILDREN, Parkplace, Cheetham Hill-road.—Female House Surgeon. Salary £120 per annum, with board, &c.
MANCHESTER ROYAL EYE HOSPITAL.—Junior House Surgeon. Salary £120 per annum, with board, &c.
MANCHESTER, VICTORIA MEMORIAL JEWISH HOSPITAL.—Resident Medical Officer for six months. Salary at rate of £100 per annum.
MOUNT VERNON HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Northwood, Middlesex.—Resident Medical Officer. Salary £120 per annum, with board, &c.
OXFORD EYE HOSPITAL.—House Surgeon.
ROCHESTER, ST. BARTHOLOMEW'S HOSPITAL.—Clinical Assistant. Salary at rate of £110 per annum, with board, &c.
ST. PANCRAS INFIRMARY.—Female Junior Assistant Medical Superintendent of South Infirmary, Pancras-road, N.W., and Junior Assistant Medical Officer of House adjacent. Salary at rate of £200 per annum, with board, &c.
SHEFFIELD, JESSOP HOSPITAL FOR WOMEN.—Junior Female House Surgeon, unmarried, for Gynæcological and Maternity Departments. Salary £160 per annum, with board, &c.
SUNDERLAND, THE ROYAL INFIRMARY CHILDREN'S HOSPITAL.—Female Resident Medical Officer for six months. Salary £100 per annum, with board, &c.
WARRINGTON, LORD DERBY WAR HOSPITAL.—Resident Anæsthetist. Salary £1 per day, with board, &c.
WESTMINSTER CITY UNION INFIRMARY, Fulham-road, S.W.—Temporary Assistant Medical Officer. Salary £250 per annum, with board, &c.

# Births, Marriages, and Deaths.

## BIRTHS.

TOPHAM.—On July 31st, at Hill Crest, Chartham, near Canterbury, the wife of J. Arthur Topham, M.R.C.S., L.R.C.P., of a son.

## MARRIAGES.

ALLNUTT—GAINSFORD.—On July 27th, at St. Saviour's Church Hitchin, Edward Bruce Allnutt, Captain, R.A.M.C., to Joan Cicely daughter of the Rev. G. B. and Mrs. Gainsford, of Woodside, Hitchin.
MECREDY—KINGSMILL.—On July 29th, at St. Andrew's Church, Bo combe, Cedric Cowan Mecredy, M.D., R.A.M.C., to Phyllis Eileen, youngest daughter of the late Judge Kingsmill, of Toronto, and of Mrs. Kingsmill, now of Burnham, Som.

## DEATHS.

HILLBROOK.—On July 22nd, at Nairobi, Captain Wallace Hillbrook, M.B., B.C. Camb., Medical Officer to the Congo Carrier Corps, B.E.A. Expeditionary Force, aged 24 years.
LISTER.—On July 17th, at sea, Lieutenant-Colonel Arthur Hugh Lister, R.A.M.C. (T.), M.D., C.M.G., M.O., 19th General Hospital, Alexandria, aged 51 years.
POWER.—On July 23th, at Holly Lodge, East Molesey, Sir William Henry Power, K.C.B., F.R.S., aged 73 years.

*N.B.—A fee of 5s. is charged for the Insertion of Notices of Births, Marriages, and Deaths.*

## METEOROLOGICAL READINGS.

*(Taken daily at 8.30 a.m. by Steward's Instruments.)*
THE LANCET Office, August 2nd, 1916.

| Date | Barometer reduced to Sea Level and 32° F. | Direction of Wind. | Rainfall. | Solar Radio in Vacuo. | Maximum Temp. Shade. | Min. Temp. | Wet Bulb. | Dry Bulb. | Remarks. |
|---|---|---|---|---|---|---|---|---|---|
| July 27 | 30·100 | S.E. | ... | 125 | 80 | 60 | 60 | 62 | Fine |
| ,, 28 | 30·220 | S.E. | ... | 113 | 79 | 61 | 61 | 64 | Fine |
| ,, 29 | 30 330 | E. | ... | 118 | 77 | 60 | 59 | 64 | Fine |
| ,, 30 | 30·270 | N.W. | ... | 124 | 82 | 62 | 61 | 66 | Fine |
| ,, 31 | 30 164 | N. | ... | 125 | 84 | 65 | 66 | 71 | Fine |
| Aug. 1 | 30·180 | N.E. | ... | 126 | 84 | 66 | 64 | 69 | Fine |
| ,, 2 | 30·214 | S.W | ... | 122 | 81 | 62 | 62 | 67 | Fine |

# Notes, Short Comments, and Answers to Correspondents.

## STUDENTS' NUMBER OF THE LANCET.

INFORMATION intended for the Students' Number of THE LANCET must be sent WITHOUT DELAY, addressed to the Sub-Editor, and marked on the envelope "Students' Number Only."

## THE NURSING PROFESSION IN INDIA.

WHEN plague first broke out in Bombay a number of Parsi ladies volunteered their services as nurses in Dr. Bahadurji's plague hospital. Their services were very useful and greatly appreciated at the time by the Parsi community, but since then nursing as a profession has not made any substantial advance in the community, because the recruits are not from the right class. While there is at present a distinct want of educated and trained Parsi nurses, a number of Parsi ladies turn their attention to becoming graduates, and afterwards find it difficult to get appointments. Dr. Masina was the first to initiate the proper nursing of patients in the Parsi wards of the Sir Jamsetjee Jeejeebhoy Hospital, and he has now projected a scheme for training Parsi women graduates as nurses, which will be put into execution if, to begin with, about half a dozen Parsi women graduates come forward to take advantage of the scheme. Dr. Masina thinks that if a few educated ladies will serve as nurses old prejudices will die out, and their success should give a great impetus to other women graduates to take up the profession. Dr. Masina lays great emphasis on the fact that the proper practice of the profession improves the moral tone of those outside the profession in the same way as, or even in a better way than, missionary work. To induce Parsi women of university education to learn nursing Dr. Masina has prepared a graduated scale of honorariums, commencing from Rs.50 and rising up to Rs.300, which will be paid to them during their training. After their full training exceptionally good nurses will be sent to Europe or America for higher training. The result of Dr. Masina's experiment will be watched with interest not only by the Parsi community but by the Indian community at large.

## TYPHOID MIXED VACCINES.

Messrs. Burroughs, Wellcome and Co., Snow Hill Buildings, London, E.C., prepare a series of mixed vaccines, No. 1 containing typhoid, paratyphoid A, and paratyphoid B bacilli. No. 1B contains in 1 c.c. 1000 million typhoid bacilli, 750 million paratyphoid A bacilli, and 750 million paratyphoid B bacilli. No. 1 contains half these quantities in 1 c.c. As is pointed out, fevers caused by paratyphoid A and paratyphoid B are responsible for a great deal of invaliding, although the mortality rates are low. Evidence goes to show that there is no diminution of the immediate immunity to typhoid by vaccination as a consequence of the addition of the other two organisms to the vaccine. The belief would appear to be justified, on the other hand, that the use of a mixed vaccine confers a definite amount of immunity against all three fevers.

## "CRAIGLEITH HOSPITAL CHRONICLE."

THE August number of this journal has several articles of interest, amongst them one entitled "Unusual Occupations Followed by the Blind," containing encouragement for those suddenly deprived of sight. It is shown how a blind clergyman may continue to follow his profession, how a blind man may conduct a coal agency, subsequently becoming the head of the firm, and how a man in humble circumstances may earn £2 a week by selling flowers. The writer offers to give advice to blind people seeking suitable occupation or to those interested in them. The magazine (price 6*d.*) may be obtained from the 2nd Scottish General Hospital, Craigleith, Edinburgh.

## THE SALE OF MEDICATED WINES.

THOSE concerned in this business have evidently found some inconvenience in complying with the General Order issued a week ago to come into force on and after August 7th, 1916, for the Control Board (Liquor Traffic) have now issued a new provision. The Order now stands that "in any case where such medicated wine or mixture or preparation is so sold or supplied at any time before the 9th day of October, 1916, it shall be deemed to be a sufficient compliance with the terms and conditions of this Order if such sealed packet bears such label." The original Order provided that the bottle should be labelled with a declaration giving the alcoholic strength of the wine in terms of proof spirit.

## EDUCATIVE CONVALESCENCE.

THE Cripple Home at Chailey was founded years ago by the Guild of Play and the Guild of the Brave Poor Things as a place where children should be trained to become independent of their physical fitness and make a well-drilled pageant of their work and play. With the Cripple Home are now associated the Princess Louise Military Wards and the Heritage Craft Schools; and Bishop Forrest Browne in an illustrated pamphlet has described how the trained crippled boys joyfully act as orderlies to the maimed soldiers and become their nurses and instructors, and how when convalescent the soldier finds the work of the carpenters and metal workers in the Craft School very catching, so that he consciously becomes a useful workman himself. The pamphlet contains many illustrations of the various useful activities of the soldiers as well as of the cripple boys and girls and the cripple babies in the Montessori School. The senior medical officer, Mr. H. S. Basden, M.R.C.S., writes on the medical aspect of the work. Funds are needed to continue it, and any further information will be gladly given by the founder and honorary secretary, Mrs. C. W. Kimmins, the Old Heritage, Chailey, Sussex.

## A USEFUL HOLIDAY GUIDE.

A HANDY book, entitled "The Holidays: Where to Stay and What to See," published by Walter Hill, 67, Southampton-row, W.C., price 1s., contains a selection of the holiday publications of the Midland, London and North-Western, Great Northern, Great Eastern, Great Western, and the Great Central railways. The illustrations, maps, and notes on the towns and districts supplied by these railways, as well as the lists of apartments, hotels, and boarding-houses, should materially help the reader in finding a suitable holiday locality.

*J. McO.*—Our correspondent acted quite rightly in declining to enter into any such bargain.

*R. L.* is thanked for his interesting suggestion.

*G. R. O.*—Application should be made to the Incorporated Society of Trained Masseuses, 159, Great Portland-street, W.; or to the London School of Massage, 211, Great Portland-street, W.

*E. B. F.*—Such synonyms do not present any difficulty to the qualified dispenser. There is undoubtedly a strong case against multiplicity of names for synthetic drugs, but a competent dispenser should not be embarrassed by remembering "laudanum" as an alternative rendering for "tincture of opium."

COMMUNICATIONS not noticed in our present issue will receive attention in our next.

## BOOKS, ETC., RECEIVED.

CHAPMAN AND HALL, London. WILEY, J., New York.
Laboratory Manual of General Microbiology. Prepared by Ward Giltner, Head of Laboratory of Bacteriology, Hygiene, and Pathology, Michigan Agriculture College. Price 10s. 6d. net.

CHURCHILL, J. AND A., London.
Urine Examination Made Easy. By Thomas Carruthers, M.A., M.B., Ch.B. Third edition. Price 1s. net.
Story of a Red Cross Unit in Serbia. By James Berry, B.S., F.R.C.S., F. May Dickinson Berry, M.D., B.S., W. Lyon Blease, LL.M., and other Members of the Unit. Price 6s. net.

CORNISH BROTHERS, Birmingham.
Economic Dishes for War-time. By Florence A. George. Price 6d.

DORNAN, W. J., Philadelphia.
Transactions of the American Surgical Association. Vol. XXXIII. Edited by J. F. Binnie, M.D.

GRIFFIN, CHARLES, AND CO., London.
A Surgical Handbook. By F. M. Caird, M.B., F.R.C.S. Edin., and C. W. Cathcart, M.B., F.R.C.S. Eng. & Edin. Seventeenth edition, with Appendix. Price 8s. 6d. net.

JOHNS HOPKINS PRESS, THE, Baltimore.
The Johns Hopkins Hospital Reports. Vol. XVII.

LIPPINCOTT, J. B., COMPANY, London and Philadelphia.
Surgical and Gynæcological Nursing. By Edward Mason Parker, M.D., F.A.C.S., Surgeon to Providence Hospital, Washington, D.C., and Scott Dudley Breckinridge, M.D., F.A.C.S., Gynæcologist to Providence Hospital, Washington, D.C. Price 10s. 6d. net.
A Text-Book of Physics and Chemistry for Nurses. By A. R. Bliss, Jr., Ph.G., Ph.Ch., A.M., Phm.D., M.D., and A. H. Olive, A.B., A.M., Ph.Ch., Phm.D. Price 6s. net.

PEARSON, C. ARTHUR, London.
Life-saving in War Time. By Mabel Palmer, M.A. With Introduction by Rt. Hon. Arthur H. D. Acland. Compiled for the Infant Welfare Propaganda Committee. Price 1s. net.

PUBLISHED BY THE AUTHOR AT BALTIMORE.
Collected Reprints of Thomas S. Cullen, M.B. Vol. II. 1916.

ROBERTSON, GEORGE, AND CO., Melbourne, Sydney, Adelaide, and Brisbane.
Practical Anatomy. By Richard J. A. Berry, M.D. Edin., M.D. Melb., F.R.S. Edin., F.R.C.S. Edin. Three Vols.

# Medical Diary for the ensuing Week.

## LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson: Diseases of Women.

TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations. Dr. Simson: Diseases of Women.

THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.

FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations

## EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention should be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, *and when accompanied by blocks it is requested that the name of the author, and if possible of the article, should be written on the blocks to facilitate identification.*

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers—not necessarily for publication.

We cannot prescribe or recommend practitioners.

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

Letters relating to the publication, sale, and advertising departments of THE LANCET should be addressed "To the Manager."

We cannot undertake to return MSS. not used.

## MANAGER'S NOTICES.

### THE INDEX AND TITLE-PAGE TO THE LANCET.
### January to June, 1916.

IN view of the Government restrictions upon the supply of paper, and the shortage of paper quite apart from these restrictions, the Index and the Title-page to the volume of THE LANCET which was completed with the issue of June 24th have been printed separately, and copies have been supplied gratis to those subscribers who have, up to August 3rd, intimated to us their wish to receive them. Other subscribers will be similarly supplied, so long as the stock remains unexhausted, on application to the Manager, THE LANCET Office, 423, Strand, London, W.C. Such application should please be sent in at once, direct to the Manager, and not through Agents.

### Volumes and Cases.

VOLUMES for the first half of the year 1916 are now ready. Bound in cloth, gilt lettered, price 16s., carriage extra.

Cases for binding the half-year's numbers are also ready. Cloth, gilt lettered, price 2s., by post 2s. 4d.

To be obtained on application to the Manager, accompanied by remittance.

### TO SUBSCRIBERS.

WILL Subscribers please note that only those subscriptions which are sent direct to the Proprietors of THE LANCET at their Offices, 423, Strand, London, W.C., are dealt with by them? Subscriptions paid to London or to local newsagents (with none of whom have the Proprietors any connexion whatever) do not reach THE LANCET Offices, and consequently inquiries concerning missing copies, &c., should be sent to the Agent to whom the subscription is paid, and *not* to THE LANCET Offices.

Subscribers, by sending their subscriptions direct to THE LANCET Offices, will ensure regularity in the despatch of their Journals and an earlier delivery than the majority of Agents are able to effect.

THE COLONIAL AND FOREIGN EDITION (printed on thin paper) is published in time to catch the weekly Friday mails to all parts of the world.

## TO COLONIAL AND FOREIGN SUBSCRIBERS.

*Subscribers abroad are particularly requested to note the rates of subscriptions given on page 4.*

The Manager will be pleased to forward copies direct from the Offices to places abroad at the rates shown, whatever be the weight of any of the copies so supplied.

## NEWSPAPERS FOR NEUTRAL COUNTRIES.

Newspapers are not at present being sent forward to neutral European countries unless posted direct from the office of publishers or newsagents who have obtained permission from the War Office for this purpose. The Publisher of THE LANCET has obtained the required permission, and he will forward copies direct from the Office to any neutral country on receipt of instructions.

**The following magazines, journals, &c., have been received:**—Practitioner, Quarterly Journal of Microscopical Science, Archives of Internal Medicine, Journal of Surgery, Journal of Physiology, Journal of the Missouri State Medical Association, Guy's Hospital Gazette, Medical Journal of South Africa, Journal of Obstetrics and Gynæcology.

## Communications, Letters, &c., have been received from—

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## Letters, each with enclosure, are also acknowledged from—

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